NATIONAL STATISTICAL INSTITUTE

ANALYSIS OF THE RESULTS
FROM QUALITY SELF-ASSESSMENT OF STATISTICAL PROCESSES
IN THE NATIONAL STATISTICAL SYSTEM OF BULGARIA

October, 2012

CONTENTS

1. INTRODUCTION

The continuous improvement of quality of statistical products and processes as well as its assessment are priority fields in statistical activity of the National Statistical System (NSS). The quality of statistical information, produced and disseminated by NSS is largely determined by the quality of statistical processes, implemented and applied by the National Statistical Institute (NSI), the bodies of Statistics and the Bulgarian National Bank (BNB).

The current analysis represents results from self-assessment in the NSS conducted in July 2012. The self-assessment was conducted by checklist and referred to the implementation of European statistics Code of practice principles related to statistical processes. The purpose of this survey was to provide information from the NSS' experts on the implementation of the principles from 7th to 10th of the European Code of Practice. This will allow to generate an overall quality assessment of statistical processes and to specify measures and directions for quality improvement.

The realization of this survey on quality of statistical processes in the NSS is conformable to the NSI experience[1] in regular quality assessment within statistical process and in accordance with the European Commission (EC) and the Council Regulations and Eurostat requirements.

2. SURVEY DESCRIPTION

2.1. Purposes

- ✓ Overall quality assessment of statistical processes within the National Statistical System.
- ✓ Assessment of methodology.
- ✓ Assessment of statistical procedures.
- ✓ Assessment of respondents' burden.
- ✓ Assessment of cost effectiveness.
- ✓ Formulation of conclusions and directions for improvement of quality of statistical processes in the NSS.

2.2. Approach

Scope:	**NSI, Bodies of Statistics and Bulgarian National Bank**
Tool:	**Checklist for quality self-assessment of statistical processes in the NSS**
Period:	**May - July 2012**
Unit response rate:	**100 %**
Questionnaire item response rate:	**80,7%**
Information processing	**SPSS** (frequency distributions and cross tables) **MS Office/Excel** (analytic tables, charts)

The Checklist for quality self-assessment of statistical processes in the NSS was developed on the base of European questionnaire for quality self assessment of statistical surveys „DESAP Self Assessment Checklist for Survey Managers (condensed version)", Questionnaire for implementation of European Statistics Code of Practice principles (CoP Questionnaire), the NSI

[1] The DESAP questionnaire was applied for the first time in NSI in 2005 and the NSI experts performed self-assessment of data quality in six statistical domains.

Questionnaire for quality self-assessment in statistical departments (2008) and Quality Self-assessment checklist for the NSS (2010).

2.3. Characteristics

The European statistics Code of Practice principles related to the quality of statistical processes are assessed by the following indicators:

Principle	Indicators
Sound Methodology	- level of compliance of overall methodological framework of surveys with European and other international standards, guidelines and good practices; - level of consistent and all over application of standard concepts, definitions and classifications in the statistical process; - frequency of update of the frame for population surveys; - usage of national statistical classifications (in compliance with adopted European classifications) in the statistical process; - presence of policy for recruitment of graduates in the relevant academic disciplines; - presence of policy for continuing vocational training of the personnel; - co-operation with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools.
Appropriate Statistical Procedures	- level of approximation of definitions and concepts used by the administrative sources to those required for statistical purposes; - systematically testing of questionnaires for statistical surveys prior to the data collection; - assessment of survey design, sample selection and estimation methods; - share of surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units; - frequency of review and revision of survey design, sample selection and estimation methods; - monitoring of data collection, entry, and coding; - share of surveys with regular monitoring and revision of data collection, entry and coding as required; - frequency of review, revision and up-dating of editing and imputation methods; - presence of standard, well-established and transparent procedures to perform revisions; - presence of procedures to document major revisions of important official statistics; - involvement in the process of determining the requirements for information content of administrative registers and design of administrative data used for

	statistical purposes; - presence of signed agreements with owners of administrative data, which set out their shared commitment to the use of these data for statistical purposes; - co-operation with owners of administrative data in assuring data quality.
Non-excessive burden on respondents	- production of statistics, which is absolutely necessary in range and detail; - fairly spread burden on respondents; - share of surveys reporting respondents' burden; - share of surveys using electronic means for obtaining information from respondents (e-mail, on-line, tablets, laptops); - share of surveys using administrative sources in order to avoid duplicating requests for information; - presence of data sharing among statistical authorities in order to avoid multiplication of surveys; - presence of signed agreements for data sharing among statistical authorities in order to avoid multiplication of surveys; - presence of measures that enable the linking of data sources in order to reduce reporting burden; - presence of formal agreements that enable the linking of data sources in order to reduce reporting burden.
Cost effectiveness	- presence of internal unit/procedure to monitor the statistical authority's use of resources (financial and HR); - presence of external body (without audit functions) for monitoring/assessing the statistical authority's use of resources (financial and HR); - assessment (4 degree scale) of optimization level of productivity potential of information and communication technologies (ICT) used in data collection, processing and dissemination; - share of surveys using modern ICT in data collection; - share of surveys using modern ICT in data processing; - share of surveys using modern ICT in data dissemination; - presence of measures that improve the statistical potential of administrative data in order to limit resource to direct surveys; - presence of standardized solutions that increase effectiveness and efficiency.

3. ANALYSIS OF THE RESULTS

The analysis of the results[2] includes an assessment of level of implementation of indicators by each principle (from 7th to 10th), related to statistical processes, as well as overall assessment of each of the principles, included in the checklist. The overall assessments of level of implementation of principles represent shares (%) according to quality degrees (high/medium/low).

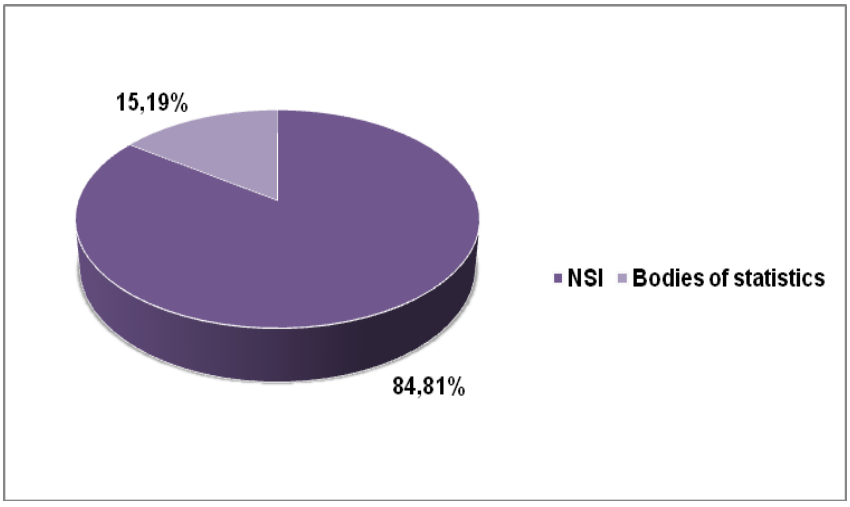
3.1. Overall characteristics of the studied units

The National Statistical System consists of the National Statistical Institute, other Bodies of Statistics and BNB[3]. They carry out the statistical activity of the state by conducting periodic or single surveys included in the National statistical programme (NSP). The statistical system of Bulgaria is based on: surveys with participation of respondents; surveys, using administrative sources; compilations; other activities and statistical infrastructure.

Current self-assessment is applied to the NSI, the other Bodies of Statistics and the BNB.

The National Statistical Institute conducts 84,81% of the surveys and activities, included in NSP for 2012. Share of the surveys and activities in Section II - Plan for statistical activities of the Bodies of statistics amounts to 15,19% of all surveys included in the Programme (Fig.1).

Figure. 1. Distribution of statistical surveys and activities included in the NSP for 2012



3.2. Overall characteristics of the surveys

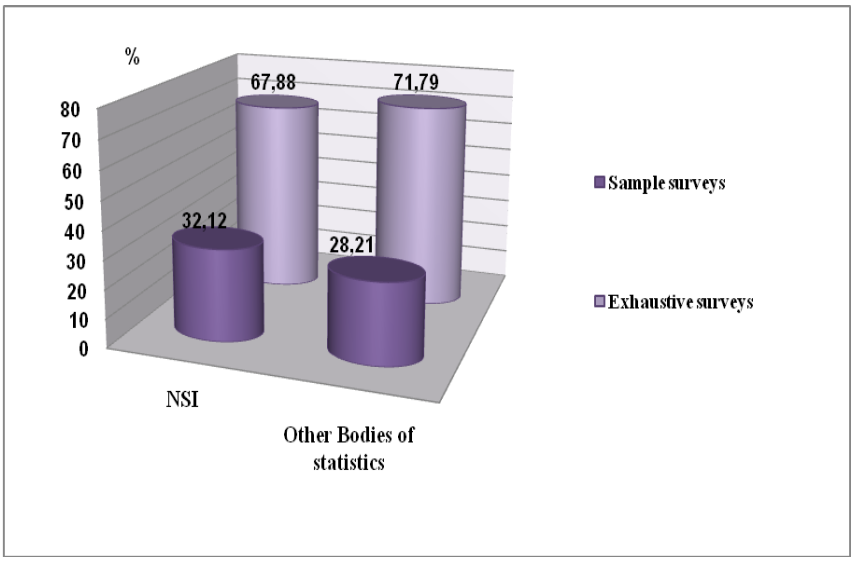
The National Statistical Institute conducts 229 statistical surveys and activities included in the NSP for 2012. Statistical surveys with the participation of respondents amount to 119. Surveys, using administrative sources are 18, compilations - 42 and other activities and statistical infrastructure - 50. The features of surveys/activities conducted by the NSI are as follows:

- Carrying out statistical surveys and activities in the following domains: Demographic and Social Statistics; Macroeconomic Statistics; Business Statistics; Statistics on Agriculture and Forestry; Multi-domain Statistics; Quality, ICT, Statistical Infrastructure and Other Activities.

[2] The analysis uses the term “Bodies of statistics” as a synonym for “respondents”, which provided information on self-assessment, including the NSI and the BNB.
[3] Law on Statistics, Art. 3, para 1 http://www.nsi.bg/dokument.php?P=64&SP=102&NSP=1#cont

- Cooperation with partners, BNB, Bodies of Statistics, users and respondents within the common institutional environment.
- Compulsory and voluntary participation of respondents.
- The share of exhaustive statistical surveys is significant - 67,88% and the share of sample surveys amounts to 32,12% (Fig. 2).
- The share of statistical surveys based on administrative sources is 7,9%.
- Application of national classifications, nomenclatures and standards.
- Dissemination of the results of statistical surveys, included in the NSP – on the NSI Internet site, general and specialized publications, data provision to Eurostat, filling in questionnaires of other international organizations and provision of information services.

Figure 2. Share of statistical surveys and activities by type according to the NSP for 2012



The Bodies of Statistics conduct 39 independent statistical surveys or collect data which are source of information to certain surveys in NSP.

Development, production and dissemination of macroeconomic and financial statistics are regulated by Memorandum of cooperation between NSI, BNB and Ministry of Finance.

The main features of surveys/activities conducted by the Bodies of statistics are as follows:

- Concentration of statistical surveys in separate themes – Health and Safety, Air and Maritime Transport, Agriculture (regarding Censuses, Agricultural Structure, Agricultural Production, Land Use and Land Cover and Agro-environmental Statistics) and Hazardous waste Statistics, as well as Trade in Goods Statistics and Intrastat system.
- Cooperation with respondents within the common institutional environment.
- Compulsory participation of respondents.
- The share of exhaustive statistical surveys is significant – 71,79% and the share of sample surveys amounts to 28,21% (Fig. 2).
- Lack of surveys based on administrative sources.
- Application of national classifications, nomenclatures and standards.

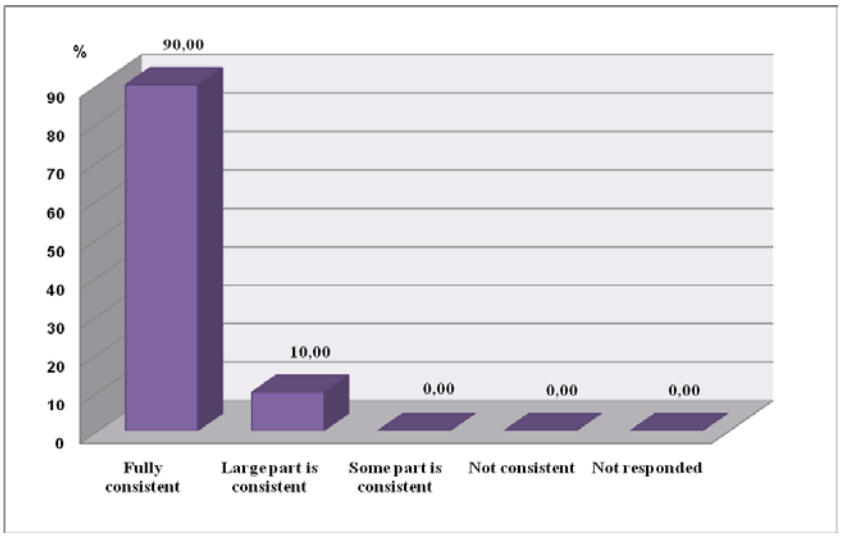
- Conformity of statistical dissemination with general requirements included in the NSP – on the Internet sites of corresponding institutions, general and specialized publications, data provision to Eurostat, filling in questionnaires of other international organizations and provision of information services.

Specific character of the surveys reflects on the response to questions and the formation of generalized results from the quality self-assessment of statistical processes.

3.3. Assessment of Principle 7 Sound Methodology

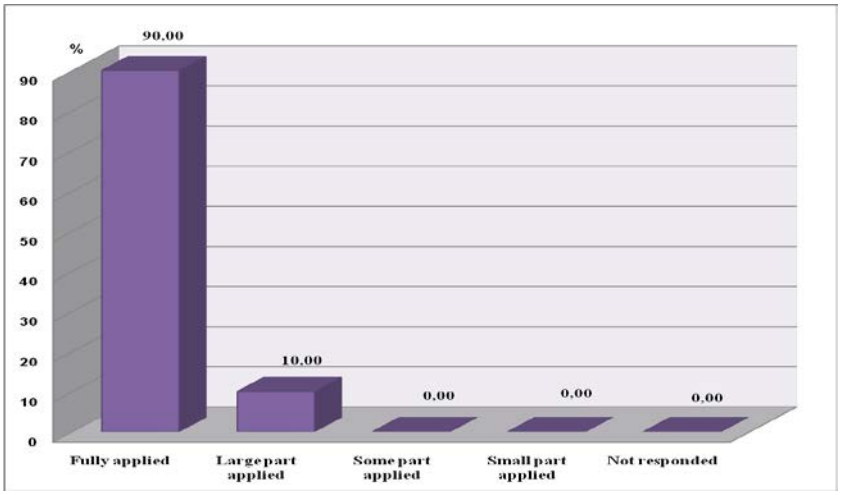
The assessment of the level of compliance of overall methodological framework of surveys with European and other international standards, guidelines and best practices is satisfactory. The predominant part (90%) of the studied units of the NSS considers that the framework is fully consistent and the other part (10%) considers that large part of it is consistent. (Fig. 3)

Figure 3. Level of compliance of the overall methodological framework of surveys with European and other international standards, guidelines and best practices



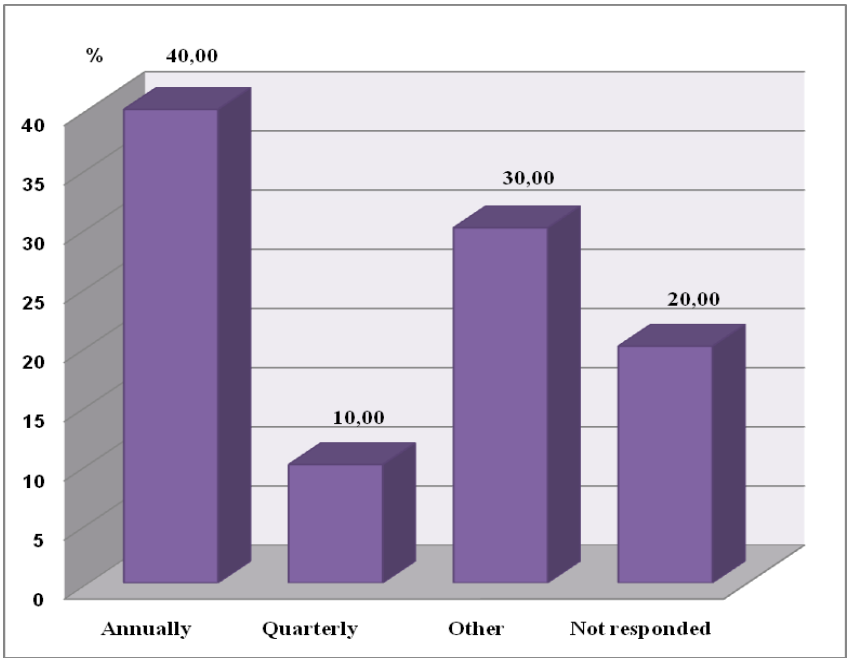
The level of consistent and all over application of standard concepts, definitions and classifications in the statistical process is similarly assessed. The standard concepts, definitions and classifications are fully applied by 90% of the Bodies of Statistics and the rest 10% of them apply large part of standard concepts, definitions and classifications in the statistical process (Fig. 4).

Figure 4. Level of consistent and all over application of standard concepts, definitions and classifications in the statistical process



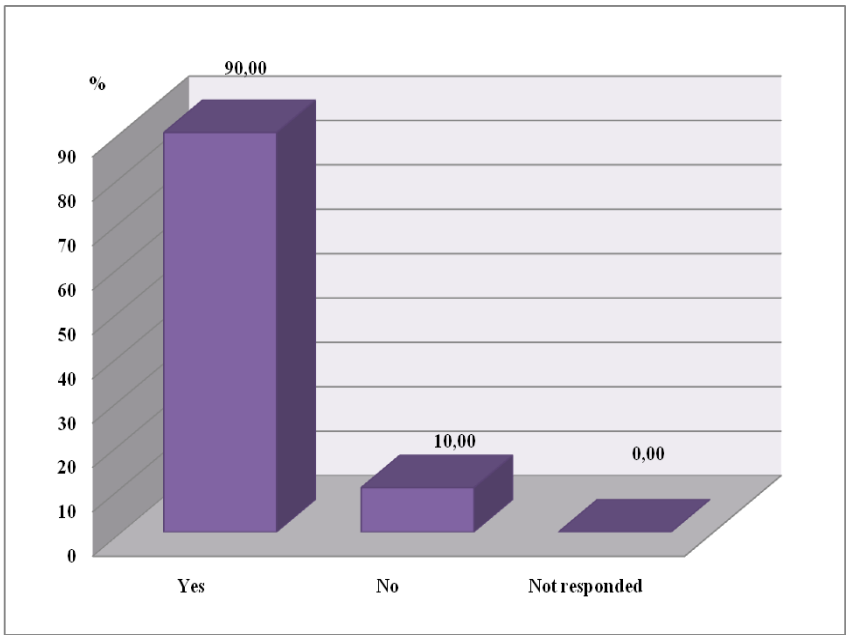
The greater part (70%) of the studied units of the NSS indicates annual or other frequency of update of the frame for population surveys. The update of the frame is quarterly for 10% of the observed units (Fig. 5).

Figure 5. Frequency of update of the frame for population surveys



The predominant part (90%) of the observed units of the NSS gave positive response to the question "Do you use national statistical classifications in the statistical process, which are in compliance with adopted European classifications?" i.e. most of the Bodies of Statistics use national statistical classifications (Fig. 6).

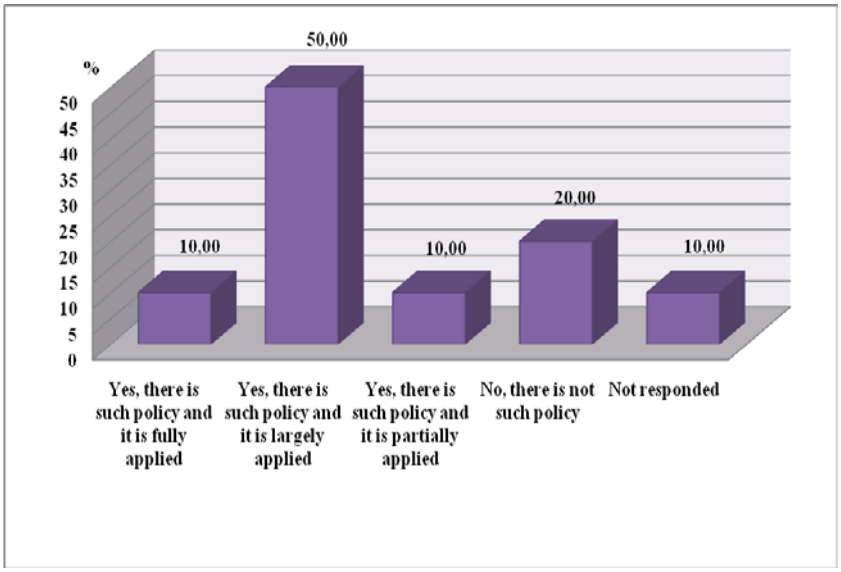
Figure 6. Usage of national statistical classifications (in compliance with adopted European classifications) in the statistical process



In assessment of "Does your authority have a policy for recruitment of graduates in the relevant academic disciplines?" 70% of the studied units of the NSS responded that they have such policy. The units which apply fully and, respectively these which apply partly this policy have same share

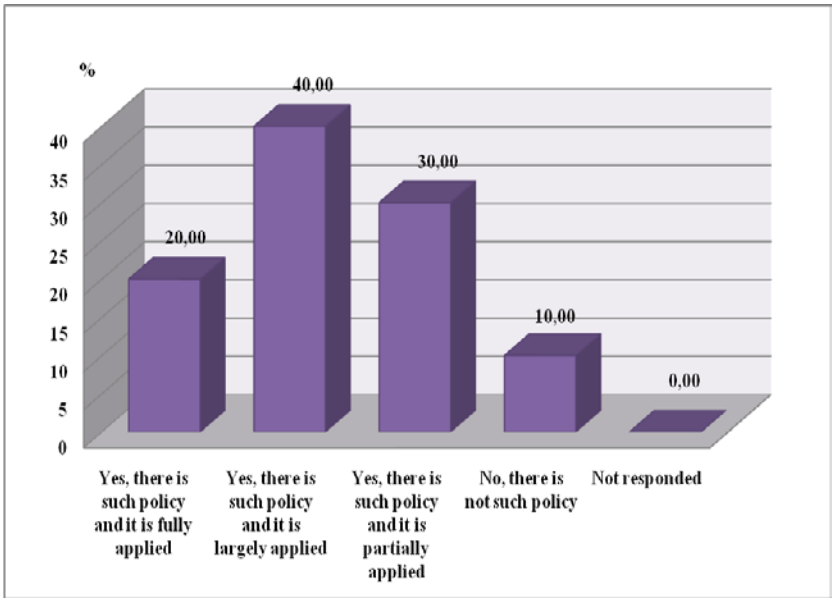
(10%). The rest 50% of the units apply this policy to a great extent. One fifth of the studied units do not have such policy. (Fig. 7)

Figure 7. Presence of policy for recruitment of graduates in the relevant academic disciplines



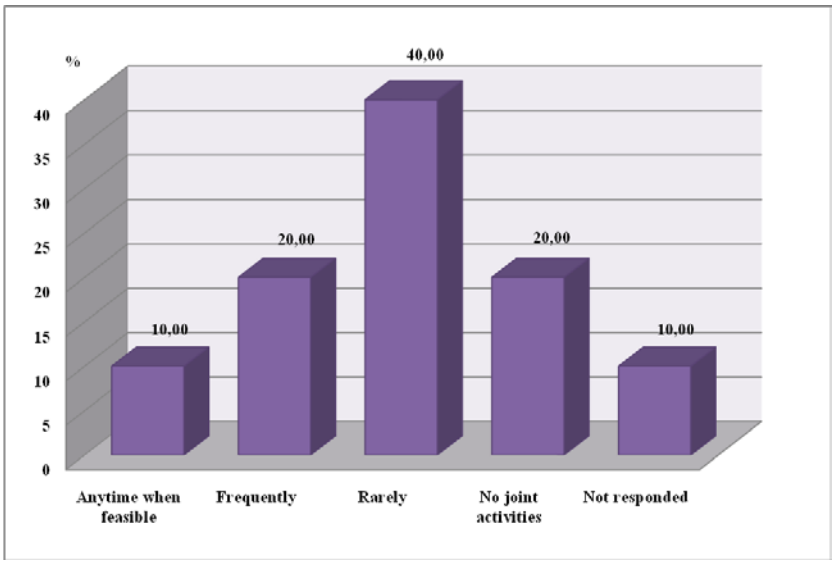
The assessment of "Presence of policy for continuing vocational training of the personnel" is satisfactory. The majority (90%) of the studied units of the NSS responded positively as 20% of them apply fully this policy, 40% - to a great extent and 30% - partly. 10% of the units do not have such policy (Fig. 8).

Figure 8. Presence of policy for continuing vocational training of the personnel



In relation to assessment of „Co-operation with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools" 10% of the studied units declared co-operation with the scientific community when feasible. One fifth of the observed units confirmed frequent co-operation with the scientific community, 40% of units indicated occasional co-operation. 20% of the observed units of the NSS do not co-operate with the scientific community (Fig. 9).

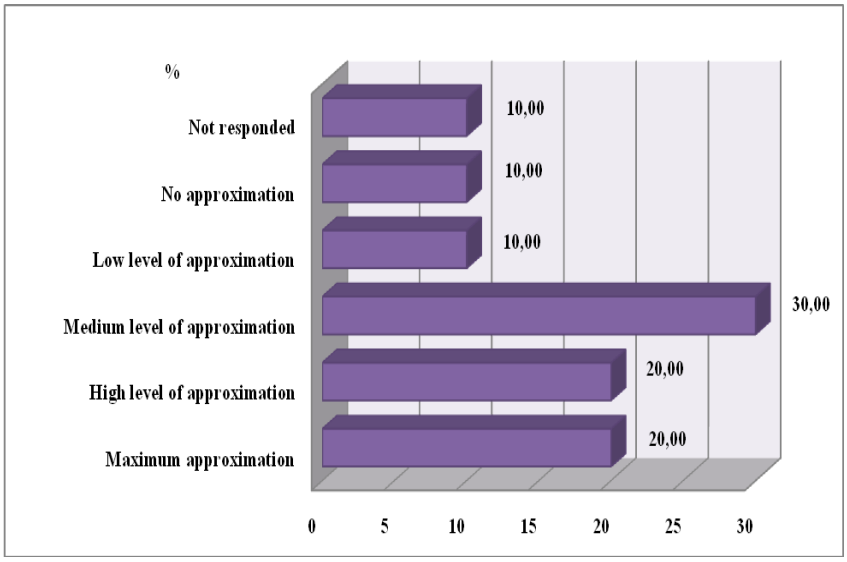
Figure 9. Co-operation with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools



3.4. Assessment of Principle 8 Appropriate Statistical Procedures

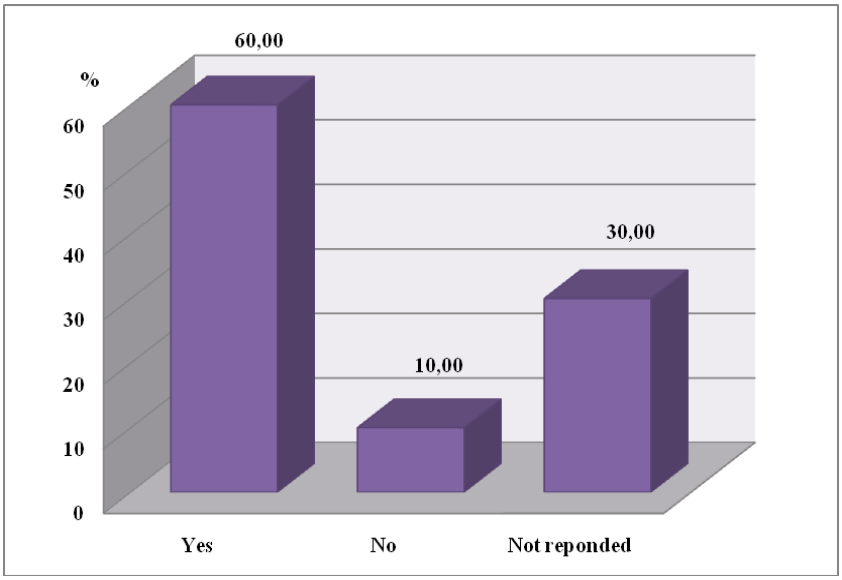
The assessment of the level of approximation of definitions and concepts used by the administrative sources to those required for statistical purposes is satisfactory. The predominant part of the studied units of the NSS (70%) confirmed that the definitions and concepts used by the administrative sources approximate to those required for statistical purposes. The shares of "Maximum approximation" and "High level of approximation" are equal (20%). "Medium level of approximation" was declared by 30% and "Low level of approximation" by 10% of the units. Another 10% of the NSS members considered that definitions and concepts used by the administrative sources do not approximate to those required for statistical purposes (Fig. 10).

Figure 10. Level of approximation of definitions and concepts used by the administrative sources to those required for statistical purposes



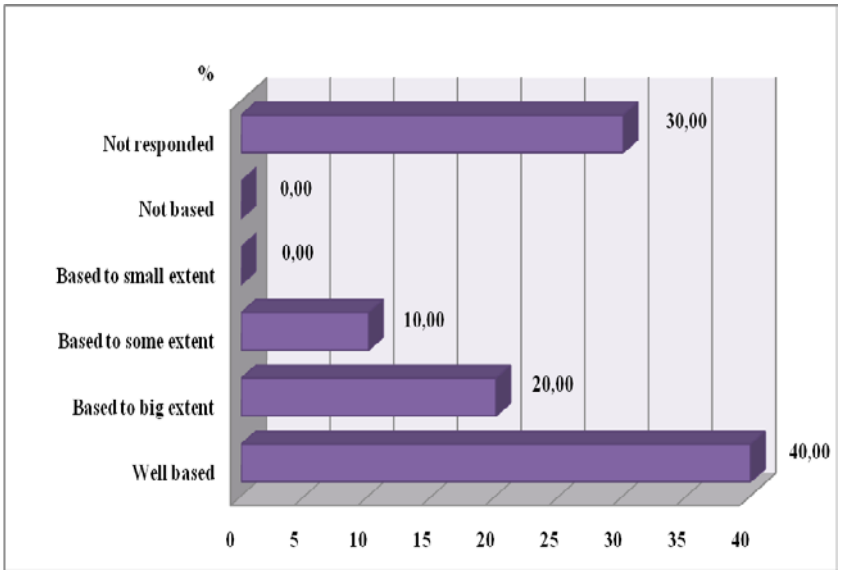
More than a half of the studied units (60%) confirmed that they systematically test questionnaires for statistical surveys prior to the data collection. 30% of the observed units did not respond to this question. Only 10% of the units do not test the questionnaires (Fig. 11).

Figure 11. Systematically testing of questionnaires for statistical surveys prior to the data collection



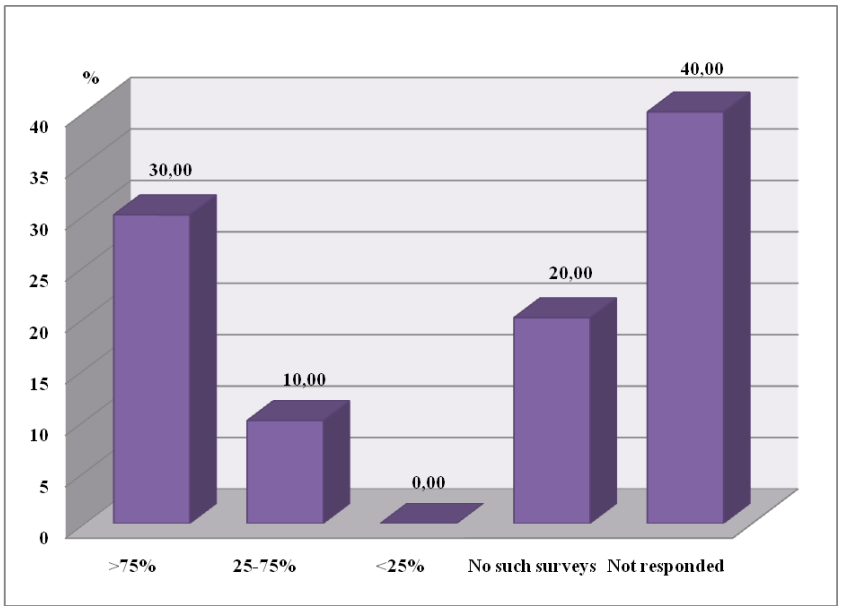
Assessment of survey design, sample selection and estimation method are well based according to 40% of the studied units. 30% of the units did not respond to this question. Assessment of survey design, sample selection and estimation method are based to big extent and to some extent according to respectively 20% and 10% of the units (Fig. 12).

Figure 12. Assessment of survey design, sample selection and estimation methods



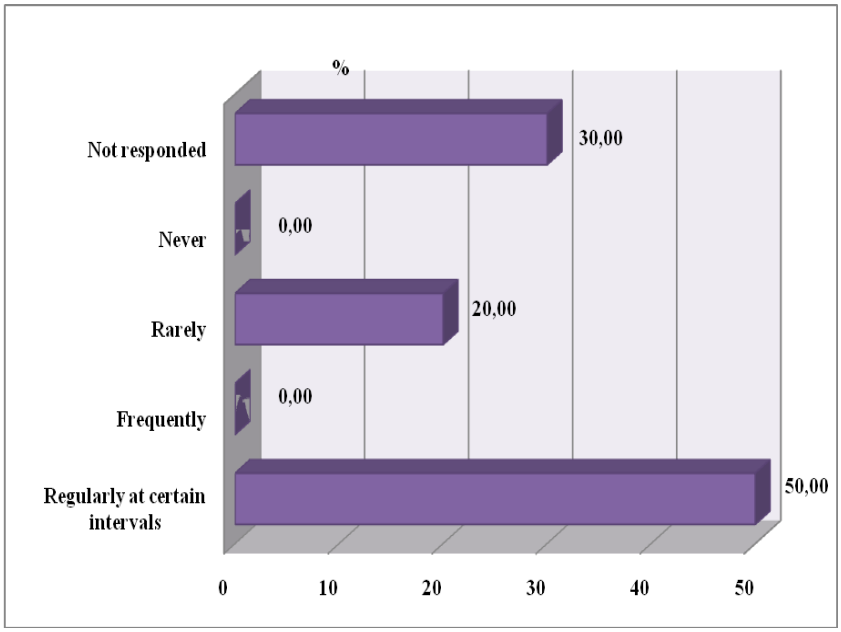
Part of the NSS members (40%) did not respond to the question related to surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units. 30% of the units indicated that such procedure exists in more than 75% of their surveys. Negative responses related to the lack of such surveys were given by 20% of the units and 10% of them indicated that the share of surveys with these procedures range between 25% and 75% (Fig. 13).

Figure 13. Share of surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units



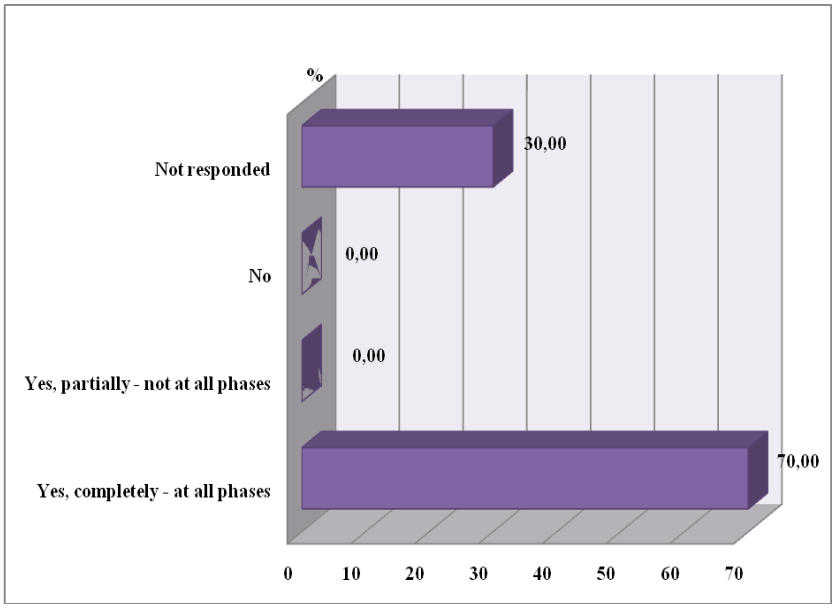
In assessment of "What is the frequency of review and revision of survey design, sample selection and estimation methods applied by your authority?" half of the units of the NSS indicated that the survey design, sample selection and estimation methods are reviewed and revised regularly. 30% of the units did not provide information. The rest 20% stated that they rarely reviewed and revised survey design, sample selection and estimation methods (Fig. 14).

Figure 14. Frequency of review and revision of survey design, sample selection and estimation methods



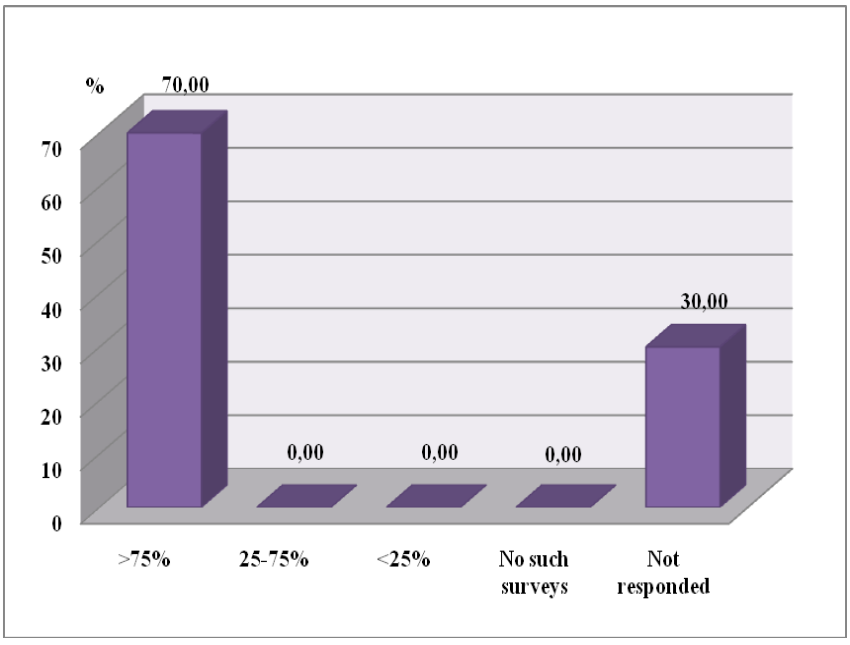
In assessment of "Do you monitor data collection, entry and coding in your authority?" 70% of the studied units confirmed monitoring of all phases and the rest 30% of units did not respond (Fig. 15).

Figure 15. Monitoring of data collection, entry and coding



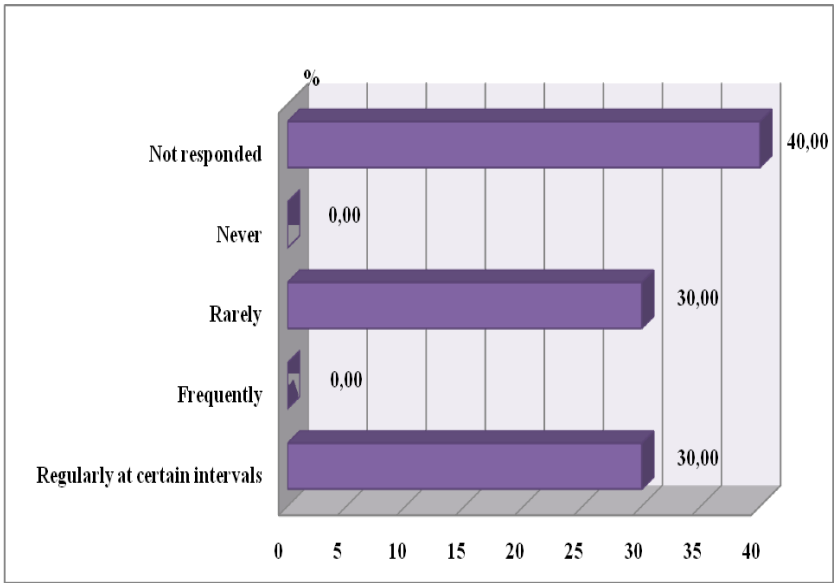
The assessment regarding the share of surveys with regular monitoring and revision of data collection, entry and coding as required is satisfactory. 70% of the units confirmed that more than 75% of surveys they carry out are regularly monitored and revised as required. The rest 30% of the units did not respond (Fig. 16).

Figure 16. Share of surveys with regular monitoring and revision of data collection, entry and coding as required



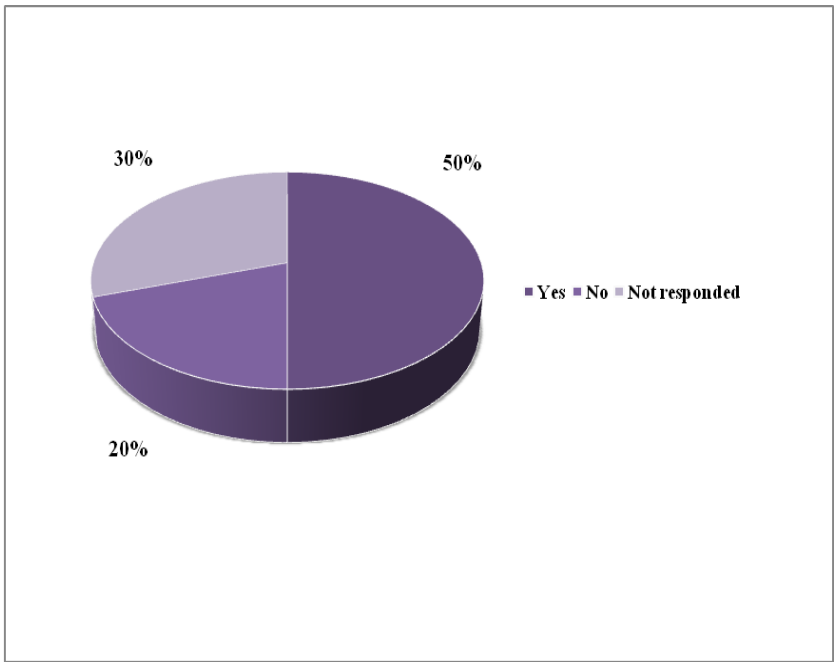
In relation to the frequency of review, revision and up-dating of editing and imputation methods 40% of the studied units did not respond. 30% of the observed units stated that they regularly carry out such review, revision and up-dating of methods. Also, the units that confirmed they rarely review, revise and up-date editing and imputation methods have the same share (30%) (Fig. 17).

Figure 17. Frequency of review, revision and up-dating of editing and imputation methods



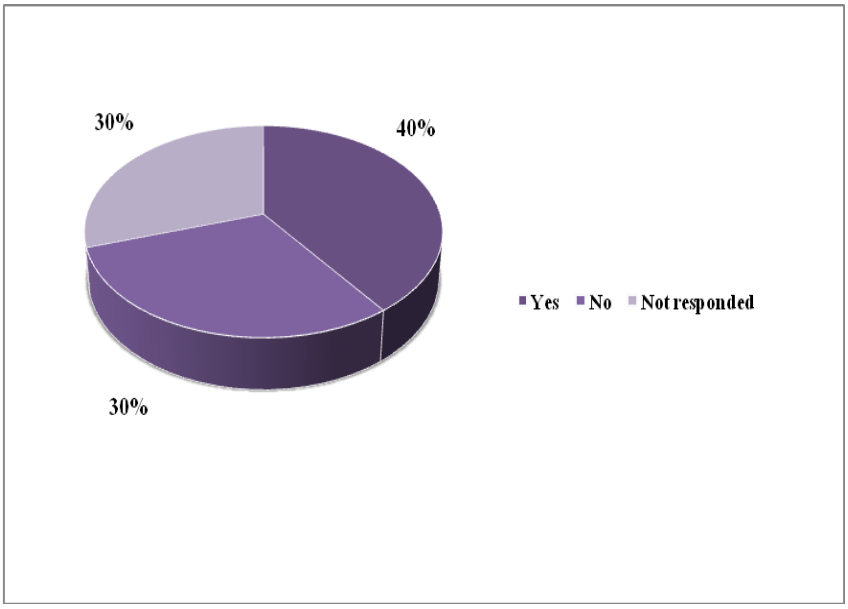
Half of the studied units of the NSS perform revisions according to standard, well-established and transparent procedures. 20% of the units indicated that they do not conduct such revisions, and 30% did not provide information (Fig. 18).

Figure 18. Revisions according to standard, well-established and transparent procedures



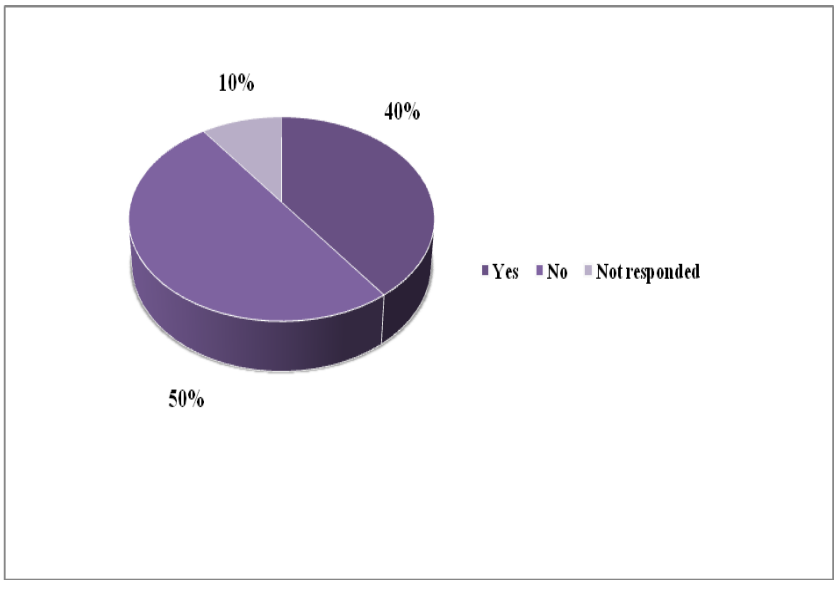
In assessment of characteristics „Presence of procedures to document major revisions of important official statistics" 40% of the observed units indicated existing procedures to document major revisions of important official statistics. Such procedures are not available for 30% of the units, and the rest (30%) of the units did not respond (Fig. 19).

Figure 19. Presence of procedures to document major revisions of important official statistics



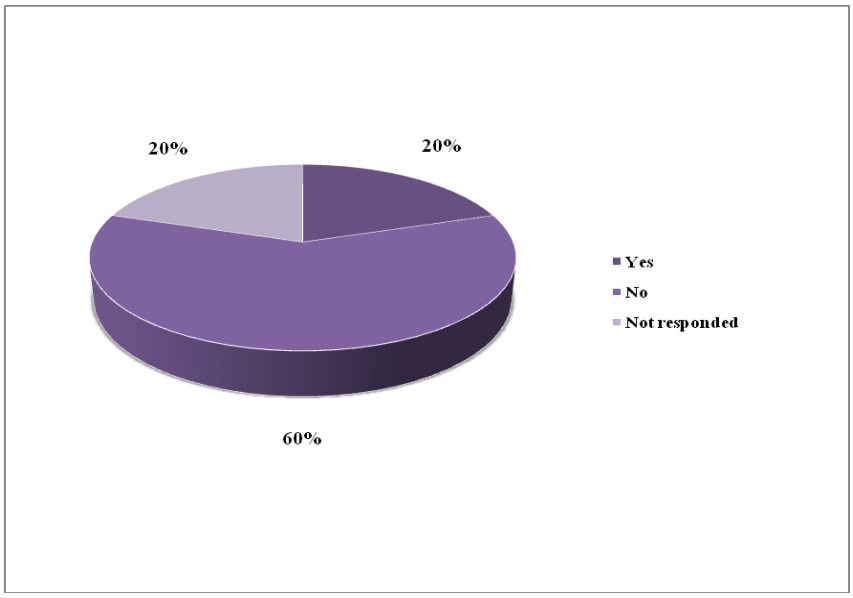
Half of the units declared that they are not involved in the process of determining the requirements for information content of administrative registers and design of administrative data used for statistical purposes. 40% of the observed units confirmed their involvement in this process, and 10% of them did not respond (Fig. 20).

Figure 20. Involvement in the process of determining the requirements for information content of administrative registers and design of administrative data used for statistical purposes



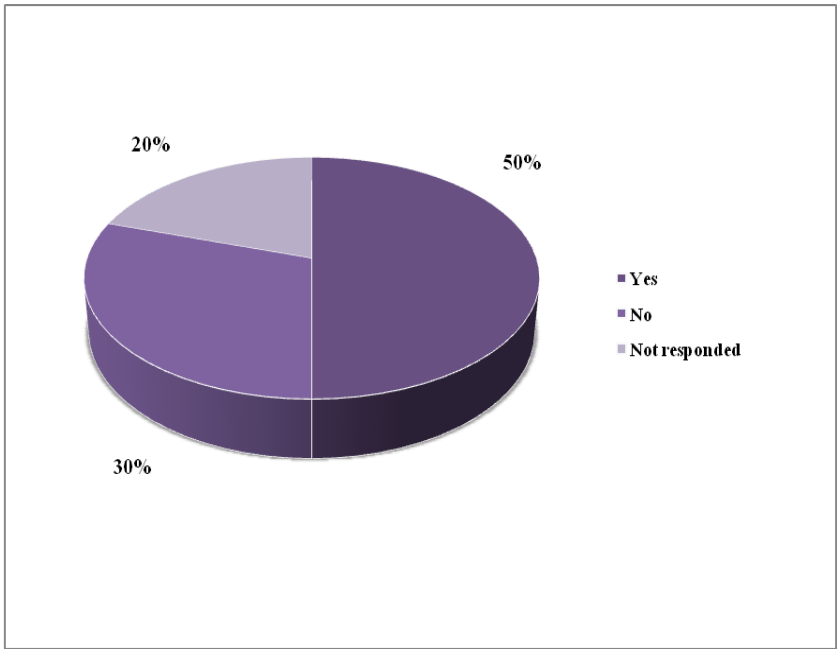
In relation to presence of signed agreements with owners of administrative data 60% of the studied units reported about the lack of such agreements at their authorities. Such agreements with set out shared commitment to the use of these data for statistical purposes exist for 20% of the units, and the rest (20%) of the units did not provide information (Fig. 21).

Figure 21. Presence of signed agreements with owners of administrative data, which set out their shared commitment to the use of these data for statistical purposes



Half of the studied units confirmed co-operation with owners of administrative data in order to ensure data quality. 30% of the units reported about the lack of such cooperation, while 20% of them did not respond (Fig. 22).

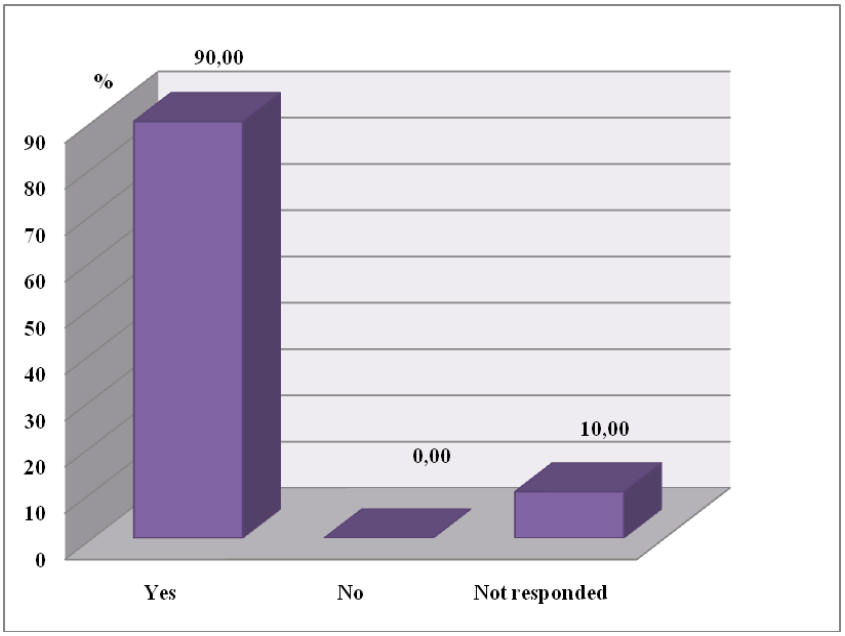
Figure 22. Co-operation with owners of administrative data in order to ensure data quality



3.5. Assessment of Principle 9 Non-excessive Burden on Respondents

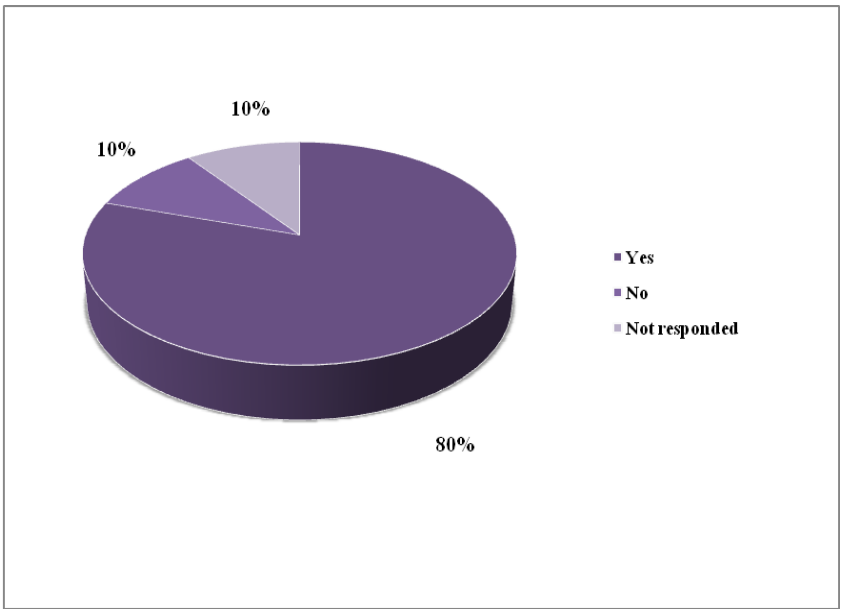
In assessment of „Is the statistical information that your authority produces limited in range and detail to what is absolutely necessary?" 90% of the studied units indicated positive response. The rest 10% of them did not provide information (Fig. 23).

Figure 23. Production of statistics, which is absolutely necessary in range and detail



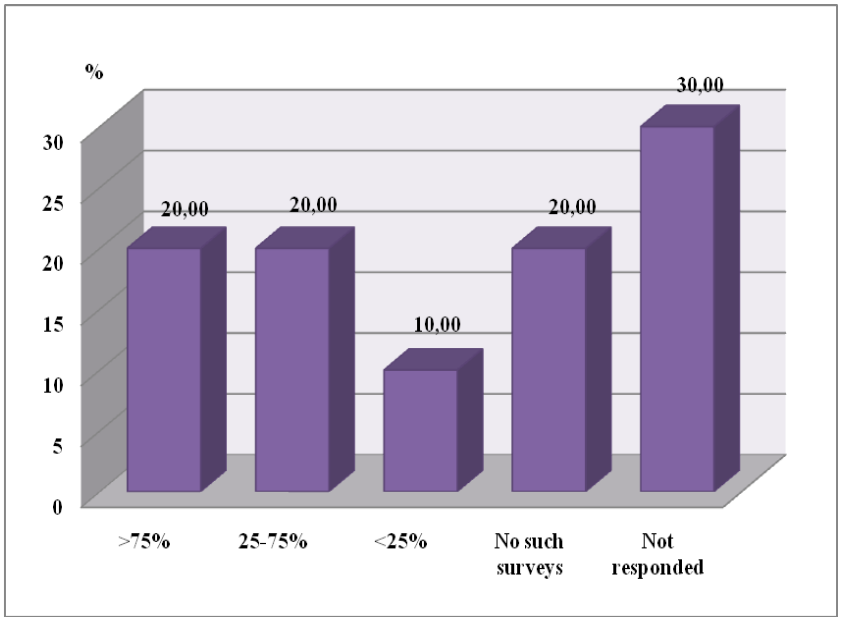
In assessment of "Do you consider the burden on respondents is fairly spread?" 80% of the Bodies of statistics determine the burden of respondents as fairly spread in view of the respondents' obligations to provide data, 10% of them did not respond (Fig. 24).

Figure 24. Fairly spread burden on respondents



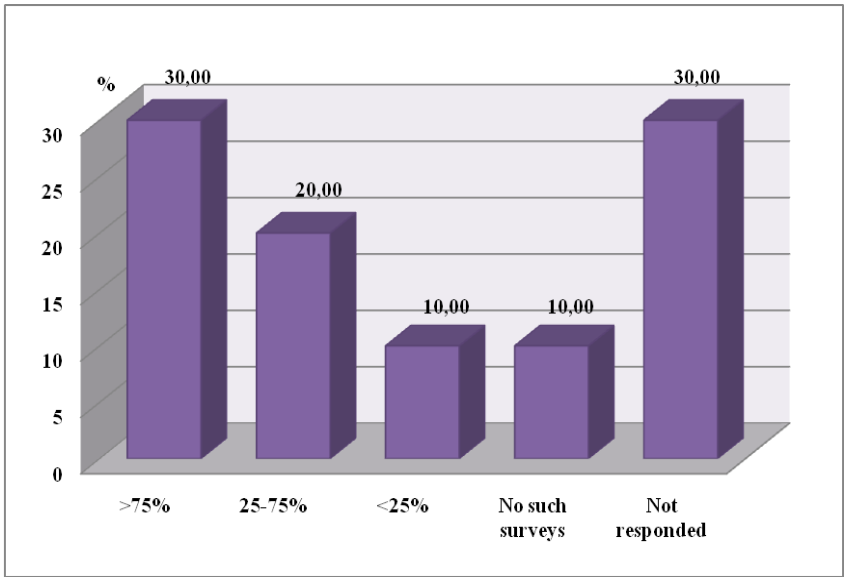
20% of the Bodies of statistics stated that they report the respondents' burden for 75% and over of their statistical surveys. The units, which report the respondents' burden for 25 to 75% of the surveys are with the same share. This share (20%) is typical for the Bodies, which responded negatively. 30% of the studied units did not respond, and 10% of the Bodies believed that the share of surveys, reporting the respondents' burden is less than 25% (Fig. 25).

Figure 25. Share of surveys reporting respondents' burden



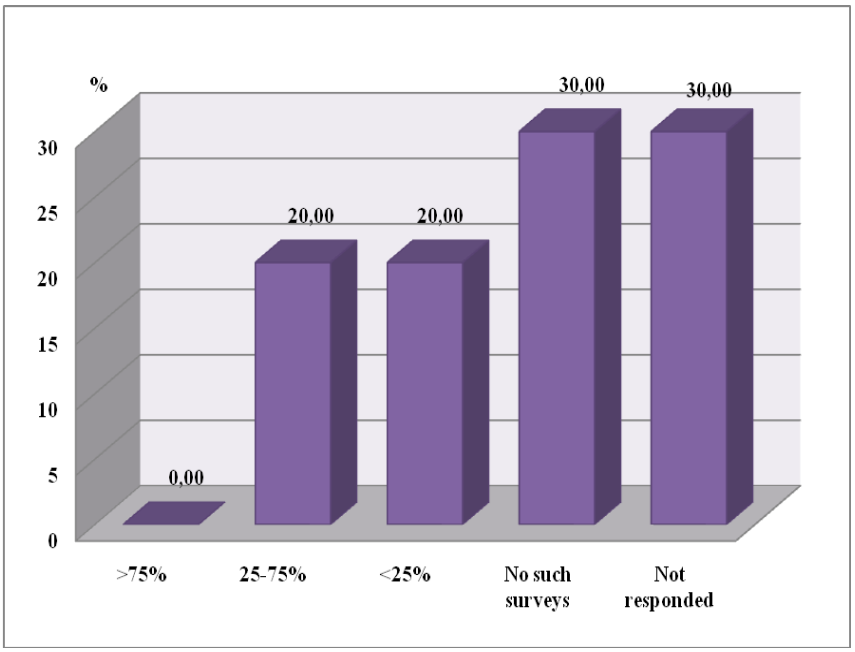
The use of electronic means (e-mail, on-line, tablets, laptops) significantly reduces the time to obtain information from respondents and respectively, their burden. 30% of the Bodies of statistics declared that the share of surveys, using electronic means is greater than 75%. The share of surveys which use electronic means is between 25 and 75% in 20% of the observed units. 10% of the Bodies of statistics indicated that the share of surveys using electronic means is less than 25%. 20% of studied units did not use such electronic means and 30% of the Bodies did not provide information (Fig. 26).

Figure 26. Share of surveys using electronic means for obtaining information from respondents (e-mail, on-line, tablets, laptops)



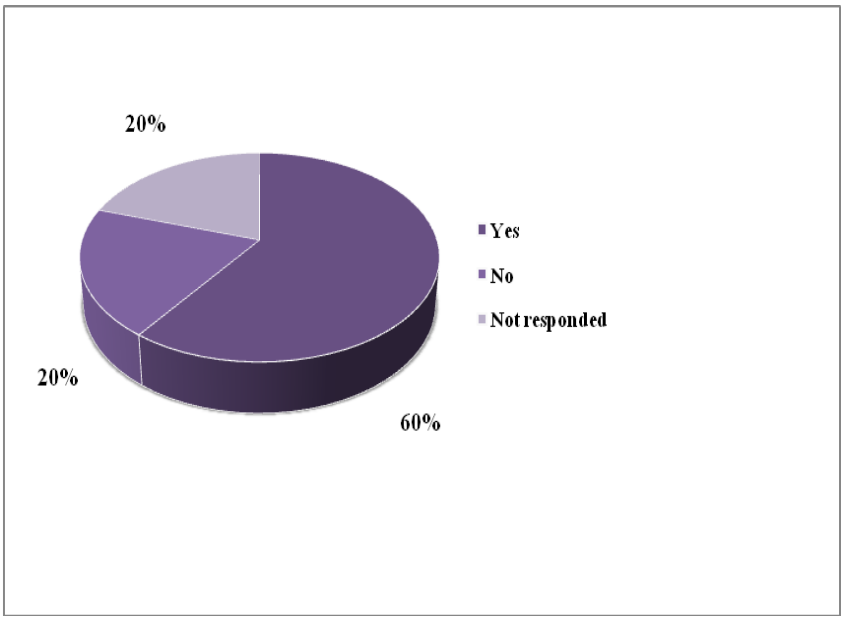
In assessment of „What is the share of surveys using administrative sources in order to avoid duplicating requests for information?" the share is equal (20%) for the Bodies that indicated that the share of surveys using administrative sources is between 25 and 75% and respectively, those with the share less than 25%. The lack of such surveys is typical for 30% of the observed units, and such is the share of those which did not respond (Fig. 27).

Figure 27. Share of surveys using administrative sources in order to avoid duplicating requests for information



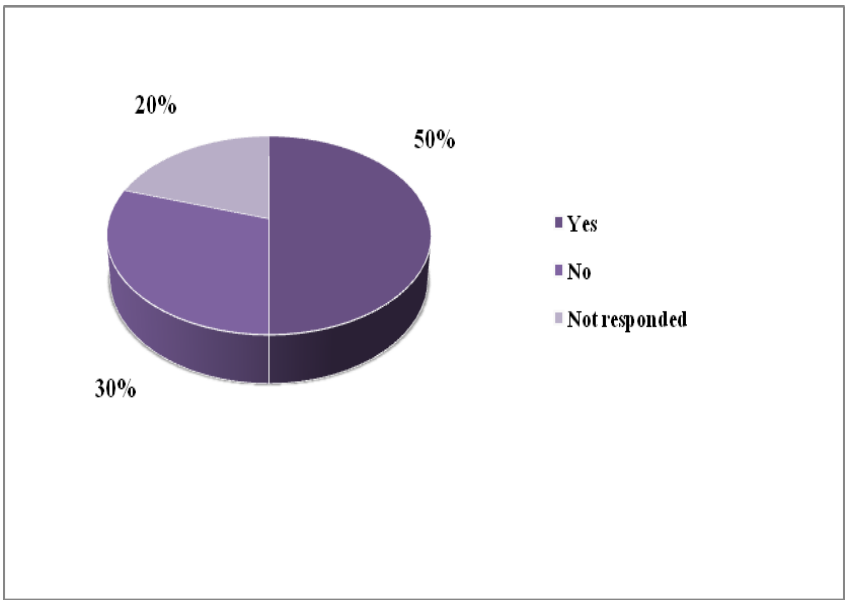
The data sharing is an important prerequisite for achieving greater coherence of activities, shortening the deadlines for obtaining and producing statistics, improving the quality of the collected information, ensuring better use of data from administrative sources and avoiding multiplication of surveys. 60% of the statistical bodies perform data sharing among statistical authorities. The lack of such data sharing is typical in 20% of the observed units (Fig. 28).

Figure 28. Presence of data sharing among statistical authorities in order to avoid multiplication of surveys



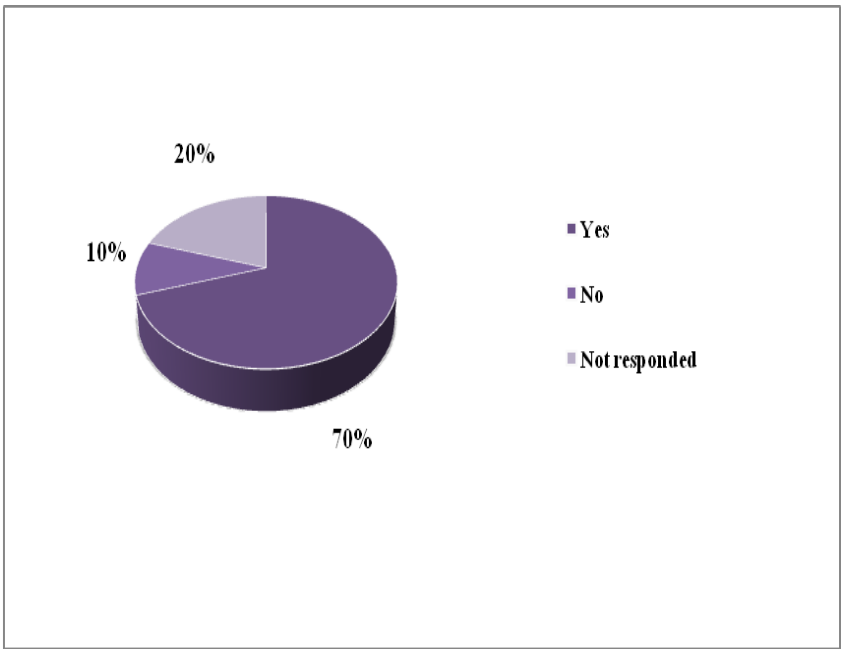
Half of the Bodies of statistics confirmed availability of signed agreements for data sharing among statistical authorities. Nearly one third (30%) of observed units reported about lack of such agreements (Fig. 29).

Figure 29. Presence of signed agreements for data sharing among statistical authorities in order to avoid multiplication of surveys



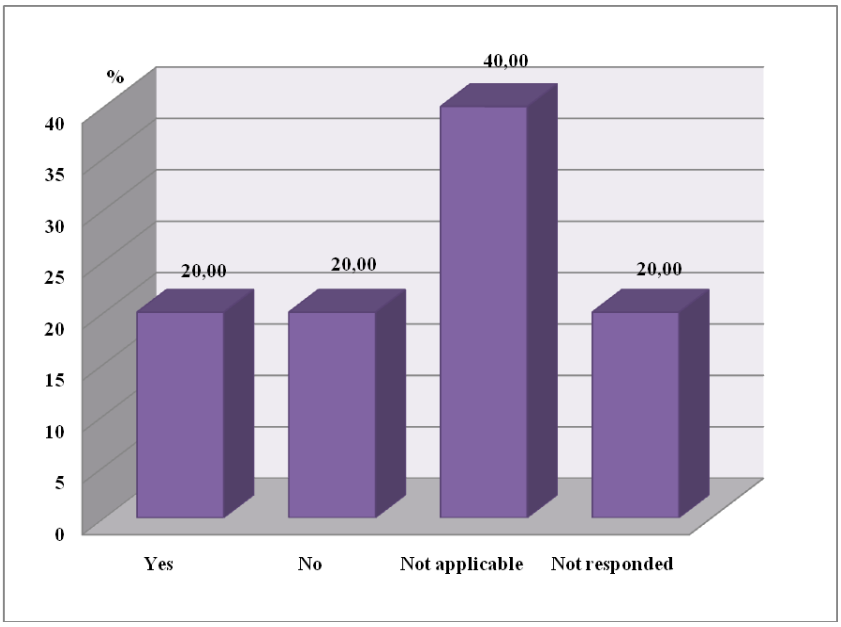
70% of the Bodies of statistics indicated that they undertake measures that enable the linking of data sources in order to reduce reporting burden. Such measures are not yet planned for 10% of studied units (Fig. 30).

Figure 30. Presence of measures that enable the linking of data sources in order to reduce reporting burden



In assessment of „Do you have formal agreements that enable the linking of data sources in order to reduce reporting burden?" one fifth of the Bodies of statistics confirmed the presence of such agreements. The lack of formal agreements is typical for 20% of the observed units. The conclusion of formal agreements that enable the linking of data sources is not relevant for 40% of the Bodies of statistics (Fig. 31).

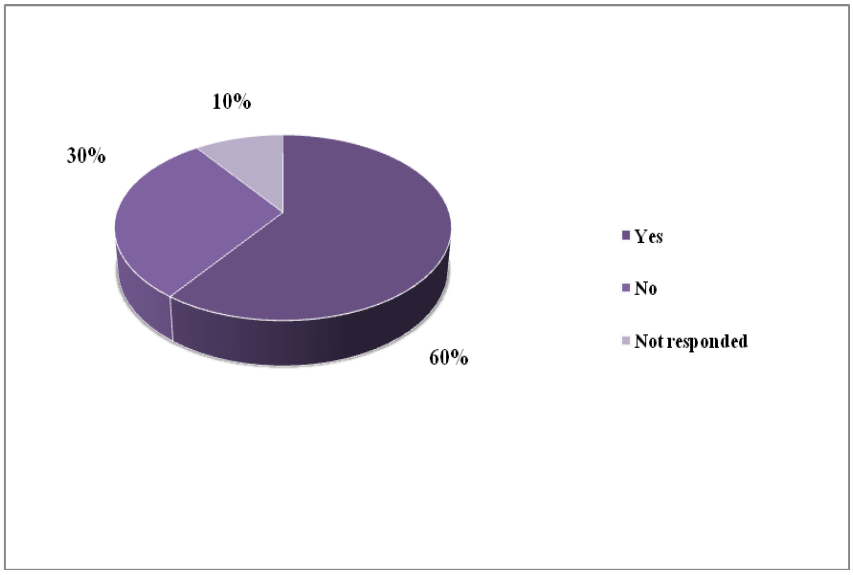
Figure 31. Presence of formal agreements that enable the linking of data sources in order to reduce reporting burden



3.6. Assessment of Principle 10 Cost Effectiveness

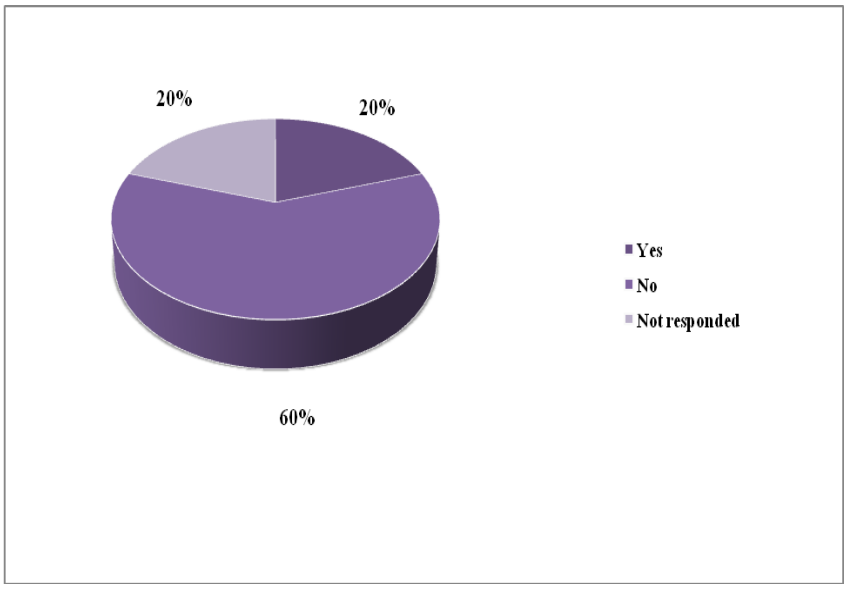
More than half of the Bodies of statistics responded positively assessing the question „Is there in your authority an internal unit/procedure to monitor the statistical authority's use of resources (financial and HR)?". The lack of such unit/procedure to monitor the statistical authority's use of resources is typical for about 30% of the studied units (Fig. 32).

Figure 32. Presence of internal unit/procedure to monitor the statistical authority's use of resources (financial and HR)



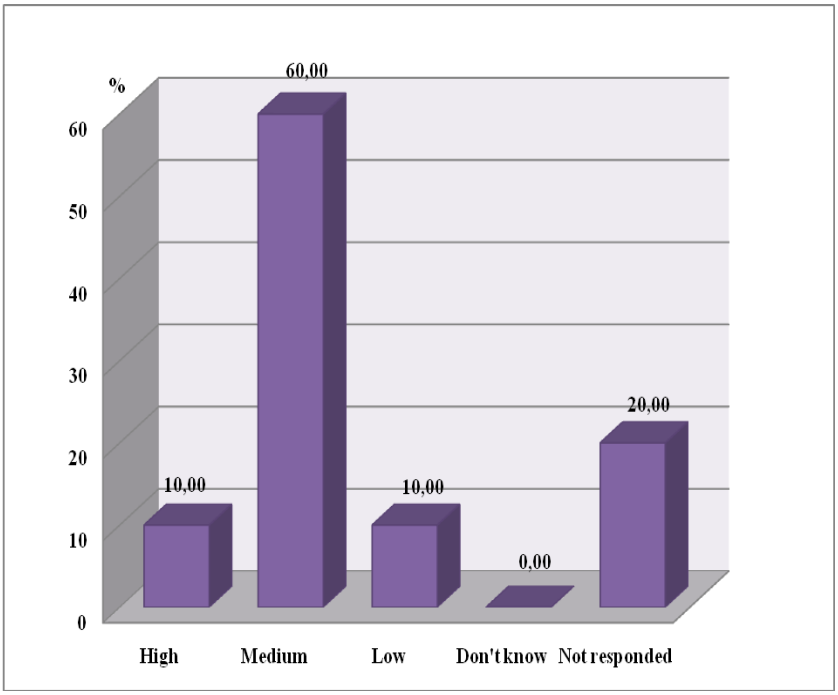
In relation to characteristics „Presence of external body (without audit functions) for monitoring/assessing the statistical authority's use of resources" more than half of the Bodies of statistics (60%) stated negative response. One fifth of the observed units confirmed the presence of an external body to monitor/assess the statistical authority's use of resources (Fig. 33).

Figure 33. Presence of external body (without audit functions) for monitoring/assessing the statistical authority's use of resources (financial and HR)



A four degree scale is used in the checklist for the assessment of optimization level of productivity potential of information and communication technologies (ICT) within the NSS. 60% of the Bodies of statistics put medium assessments. 10% of the studied units marked high assessments of optimization level of productivity potential. The same share is reported for the observed units with low assessments of the optimization level of productivity potential (Fig. 34).

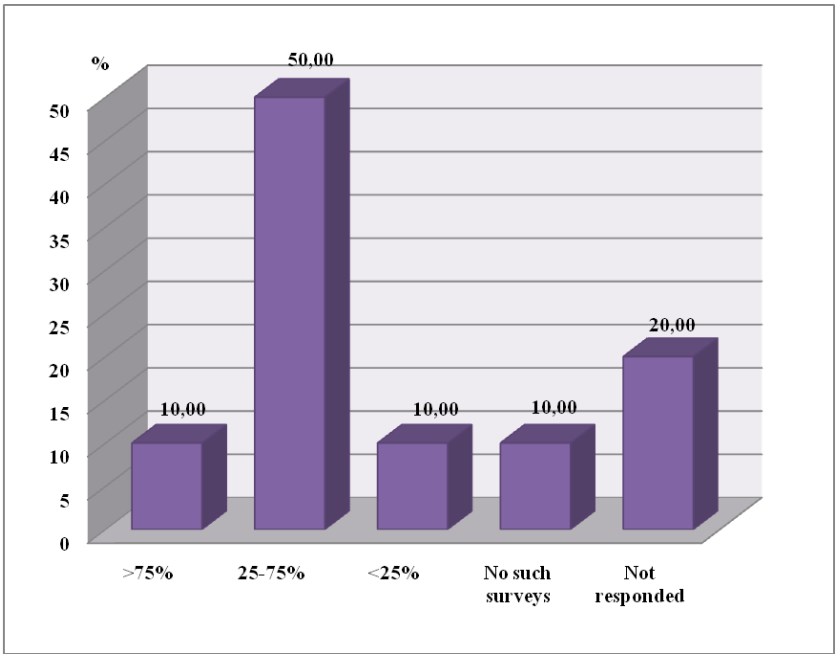
Figure 34. Assessment (4 degree scale) of optimization level of productivity potential of information and communication technologies (ICT) used in data collection, processing and dissemination



Half of the Bodies of statistics stated that the share of surveys using modern ICT in data collection varies between 25 and 75%. The units, which consider that the share of these surveys is greater than 75% and, respectively, the units which declared that the share of surveys is less than

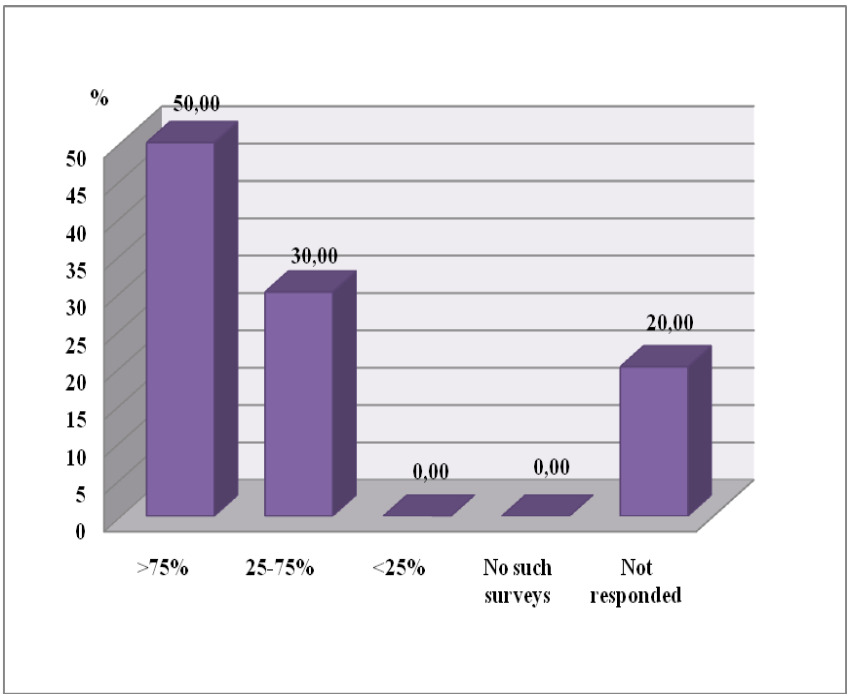
25% are with equal shares – 10%. 10% of the Bodies of statistics do not carry out statistical surveys using modern ICT (Fig. 35).

Figure 35. Share of surveys using modern ICT in data collection



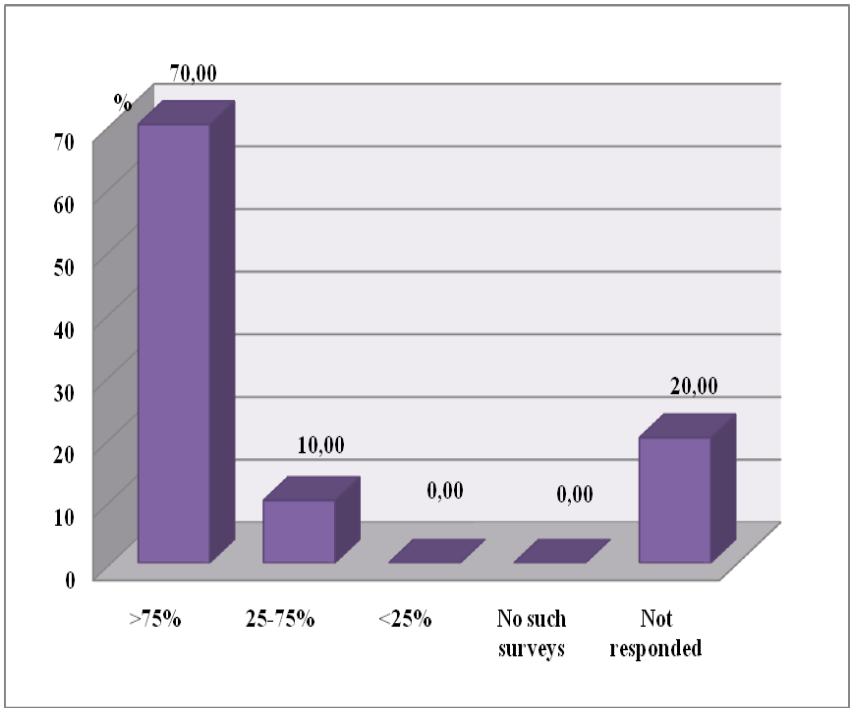
The assessment of the use of modern ICT in data processing is satisfactory. Half of the Bodies of statistics indicated that the share of surveys using modern ICT is higher than 75%. 30% of the observed units reported that the share of surveys using modern ICT in data processing is between 25 and 75% (Fig. 36).

Figure 36. Share of surveys using modern ICT in data processing



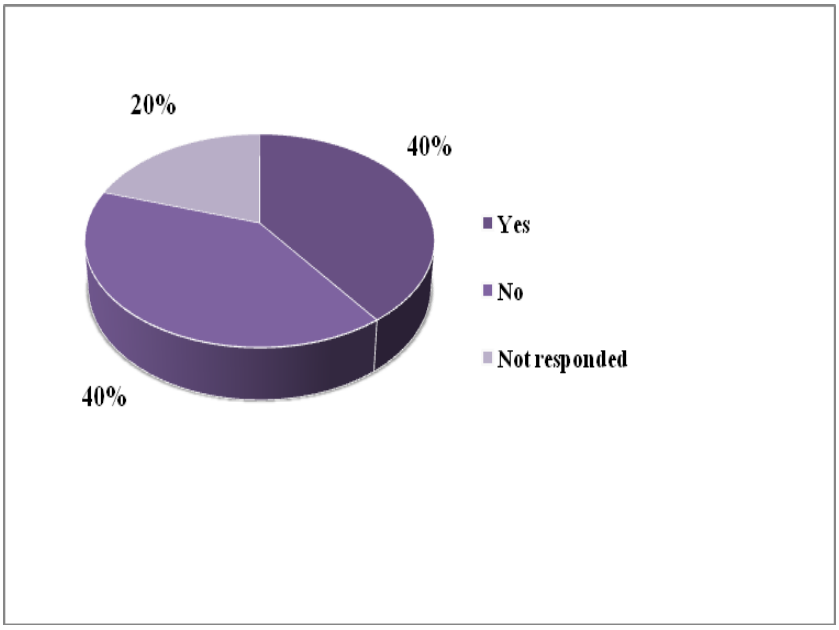
A positive trend is observed concerning the use of modern ICT in data dissemination. 70% of the Bodies of statistics stated that the share of surveys using modern ICT in data dissemination is greater than 75%. This share varies between 25 and 75% for 10% of the studied units (Fig. 37).

Figure 37. Share of surveys using modern ICT in data dissemination



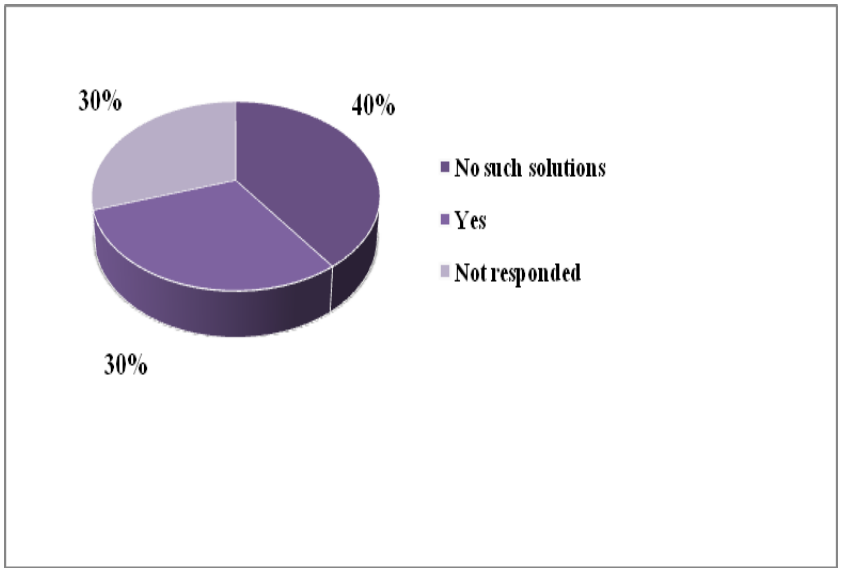
Regarding the characteristic "Presence of measures that improve the statistical potential of administrative data" 40% of the Bodies of statistics reported that they undertake such measures. This is the share of those units which responded negatively (Fig. 38).

Figure 38. Presence of measures that improve the statistical potential of administrative data in order to limit resource to direct surveys



Nearly one third of the studied units stated that they implement standardized solutions that increase effectiveness and efficiency. The lack of such decisions is typical for 40% of the Bodies of statistics (Fig. 39).

Figure. 39. Presence of standardized solutions that increase effectiveness and efficiency



4. CONCLUSION

4.1. Overall Assessment of Principles

Examination of the results shows that the first place is for principle 7 Sound methodology, which was highly assessed by the Bodies of statistics. The medium assessment and the second place are for principle 10 Cost effectiveness. The last two principles: Appropriate statistical procedures and Non-excessive burden on respondents were medium assessed from the half of the Bodies of statistics. No one of the principles was low assessed.

Table №1 Overall assessment of European statistics Code of Practice principles related to quality of statistical processes

Assessment[4] / Principle	High (%)	Medium (%)	Low (%)	No answer (%)	Indicators[5]
Sound methodology	100,00	0,00	0,00	0,00	6,00
Appropriate statistical procedures	30,00	50,00	0,00	20,00	3,80
Non-excessive burden on respondents	30,00	50,00	0,00	20,00	3,80
Cost effectiveness	30,00	60,00	0,00	10,00	4,20
General quality indicator[6]					**4,45**

[4] Assessments are average quantity of quality degrees – high (6), medium (4), low (2).

[5] The component indicators are average of quantity of quality degrees weighed by the number of observation units. I OF COMPONENT = Σ (degree 6 x number of assessments "High" + degree 4 x number of assessments "Medium" + degree 2 x number of assessments "Low") / total number of observation units.

[6] General quality indicator calculates as weighted average of component indicators.

4.2. Results

The analysis of the results from the self-assessment presents quality of statistical processes according to indicators on individual principles from 7th to 10th of the European statistics Code of Practice as follows:

Sound methodology

- The predominant part of the Bodies of statistics confirms that the overall methodological framework of surveys is fully compliant.
- The majority of the Bodies of statistics fully applies consistently standard concepts, definitions and classifications in the statistical process throughout the statistical authority.
- The frame for population surveys within the NSS is updating most annual or with other frequency.
- The significant part of the Bodies of statistics uses national statistical classifications, which are in compliance with adopted European classifications within the statistical process.
- Most of the Bodies of statistics have policy for recruitment of graduates in the relevant academic disciplines.

Appropriate statistical procedures

- The definitions and concepts used by the administrative sources are approximated to those required for statistical purposes. Nearly one-third of the units indicated “Medium level of approximation”.
- More than a half of the Bodies of statistics systematically test questionnaires for statistical surveys prior to the data collection.
- Most units confirm that the survey design, sample selection and estimation methods are well based.
- The half of the Bodies of statistics carry out regularly reviews and revisions of survey design, sample selection and estimation methods.
- The regular monitoring of the phases: data collection, entry and coding is carrying out by the significant part of the studied units.
- The large share of the studies (>75%) in which the collection, implementation and coding of data are regularly monitored and revised as required is typical for most of the Bodies of statistics.
- The standard, well-established and transparent procedures for carrying out revisions are typical for half of the studied units.
- The half of the Bodies of statistics co-operates with owners of administrative data in order to assure data quality.

Non-excessive burden on respondents

- The production of absolutely necessary statistics in range and detail is typical for the predominant part of the studied units.
- The majority of the Bodies of statistics confirmed fairly spread burden on respondents.
- Half of the Bodies of statistics have signed agreements for data sharing among statistical authorities.

- More than half of the Bodies of statistics carry out data sharing among statistical authorities in order to avoid multiplication of surveys.
- A significant part of the studied units undertake measures that enable the linking of data sources in order to reduce reporting burden.

Cost effectiveness

- Most of the Bodies of statistics have an internal unit/procedure to monitor the statistical authority's use of resources (financial and HR).
- The level of optimization of the productivity potential of ICT used in the data collection, processing and dissemination is assessed as "Medium" by more than a half of the Bodies of statistics (a 4-point scale used for assessment).
- Half of the Bodies of statistics indicated that the share of surveys, which use modern ICT in data collection is between 25 and 75%.
- Half of the Bodies of statistics stated that the share of surveys which use modern ICT in data processing is higher than 75%.
- A significant part of the Bodies of statistics reported that the share of surveys which use modern ICT in data dissemination is greater than 75%.

Overall assessments of the principles

- There are no low assessments of the principles;
- Principle 7 Sound methodology is the highest assessed principle;
- Principle 8 Appropriate statistical procedures and Principle 9 Non-excessive burden on respondents are the lowest assessed principles in comparison with overall assessments of the other principles.

4.3. Directions for Improvement

The National Statistical System is faced to the following challenges and possibilities to improve the quality of statistical processes:

- Improvement of the implementation status for indicators to the principles which have medium assessments.
- Co-operation with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools.
- Extension of the share of surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units.
- Strengthening the involvement of the Bodies of statistics in the process of determining the requirements for information content of administrative registers and design of administrative data used for statistical purposes.
- Wider implementation of procedures to document major revisions of important official statistics.
- Strengthening cooperation with owners of administrative data and signing formal agreements, which set out their shared commitment to the use of these data for statistical purposes.
- Expanding the use of administrative data for statistical purposes.
- Expanding the share of surveys reporting respondents' burden.

- Expanding the share of surveys using electronic means for obtaining information from respondents (e-mail, on-line, tablets, laptops).
- Expanding the share of surveys using administrative sources to avoid duplicating requests for information.
- Increase the number of formal signed agreements that enable the linking of data sources in order to reduce reporting burden.
- Undertake necessary measures to establish an internal unit (without audit functions) to monitor/ assess the statistical authority's use of resources (financial and HR).
- Higher degree of compliance with the cost benefits of the statistics.
- Establish effective relationships with respondents and implementation of a system for measuring and monitoring respondents' burden.
- Extension of measures that improve the statistical potential of administrative data in order to limit resource to direct surveys.
- Implementation of standardized solutions that increase effectiveness and efficiency.

4.4. Some Comments on Principles

The statistical process covers different phases within the National statistical system. Not all of them are overlapping in the statistical production, i.e. only some of them are typical at the same time for the NSI, the Bodies of Statistics and the Bulgarian National Bank. Therefore, some of the questions included in the questionnaire (in particular those related to principle 8) proved not applicable for some of the Bodies of statistics, whose statistical production is not passing through a certain phase.

5. ANNEXES

5.1. *Annex 1*: Quality Self-assessment Checklist for the National Statistical System

The quality of statistical information, produced and disseminated by the National Statistical System (NSS) is largely determined by the quality of statistical processes, implemented and applied by the National Statistical Institute (NSI), the Bodies of Statistics and the Bulgarian National Bank.

The checklist below is applied for quality self-assessment of the NSS referred to the implementation of European statistics Code of Practice Principles from 7th to 10th related to statistical processes.

The checklist includes the following types of questions:
a) Closed
b) Four degree scale for assessment
c) Questions with a free response (comment)

Quality Self-assessment Checklist
on the implementation of Principles from 7th to 10th
of the European Statistics Code of Practice:

Principle 7 Sound Methodology
Principle 8 Appropriate Statistical Procedures
Principle 9 Non-excessive Burden on Respondents
Принцип 10 Cost Effectiveness

Section I. Identification

Authority:	
Directorate/Department:	
Self assessment responsible person(s); /E-mail:	1.
	2.

Section II. Quality of statistical processes within the NSS

II. Principle 7: Sound Methodology. Sound methodology underpins quality statistics. This requires adequate tools, procedures and expertise.			
II. 7.1	To what level does the overall methodological framework of surveys conducted by your authority comply with European and other international standards, guidelines and best practices?	1. Fully compliant	☐
		2. A large part is compliant	☐
		3. A certain part is compliant	☐
		4. Not compliant	☐
II. 7.2	Does your authority apply consistently and all over standard concepts, definitions and classifications in the statistical process?	1. Fully applied	☐
		2. A large part applied	☐
		3. A certain part applied	☐
		4. A small part applied	☐
II. 7.3	What is the frequency of update of the frame for population surveys in your authority?	1. Annually	☐
		2. Quarterly	☐
		3. Other: (*please specify*)	☐
II. 7.4	Does your authority use national statistical classifications in the statistical process, which are in compliance with adopted European classifications?	1. Yes	☐
		2. No	☐
II. 7.5	Does your authority have a policy for recruitment of graduates in the relevant academic disciplines?	1. Yes, there is such a policy and it applies fully.	☐
		2. Yes, there is such a policy and it applies to a great extent.	☐
		3. Yes, there is such a policy and it applies partly.	☐
		4. No, there is no such policy.	☐
II. 7.6	Does your authority have a policy for continuing vocational training of the personnel?	1. Yes, there is such a policy and it applies fully.	☐
		2. Yes, there is such a policy and it applies to a great extent.	☐
		3. Yes, there is such a policy and it applies partly.	☐
		4. No, there is no such policy.	☐

II. 7.7	Does your authority cooperate with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools?	1. Anytime when feasible.	☐
		2. Frequently.	☐
		3. Rarely.	☐
		4. No joint activities.	☐
Your comments on Principle 7 **Sound Methodology**: *Please describe how do you assess this principle in your practice and what is your approach for its improvement..*			
II. Principle 8: Appropriate Statistical Procedures. Appropriate statistical procedures, implemented from data collection to data validation, underpin quality statistics.			
II. 8.1	To what level of approximation are the definitions and concepts used by the administrative sources to those required for statistical purposes?	1. Maximum level of approximation.	☐
		2. High level of approximation.	☐
		3. Medium level of approximation.	☐
		4. Low level of approximation.	☐
		5. No approximation.	☐
II. 8.2	Are the questionnaires for statistical surveys systematically tested prior to the data collection?	1. Yes	☐
		2. No	☐
II. 8.3.1	How do you assess survey design, sample selection and estimation methods, applied by your authority?	1. They are well based.	☐
		2. They are based to big extent.	☐
		3. They are based to some extent.	☐
		4. They are based to small extent.	☐
		5. Not based.	☐
II. 8.3.2	What is the share of surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐

II. 8.3.3	What is the frequency of review and revision of survey design, sample selection and estimation methods applied by your authority?	1. Regularly at certain intervals	☐
		2. Frequently	☐
		3. Rarely	☐
		4. Never.	☐
II. 8.4.1	Do you monitor data collection, entry and coding in your authority?	1. Yes, completely - at all phases	☐
		2. Yes, partially - not at all phases	☐
		3. No	☐
II 8.4.2	What is the share of surveys with regular monitoring and revision of data collection, entry and coding as required?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 8.5	How do you assess the frequency of review, revision and up-dating of editing and imputation methods in your authority?	1. Regularly at certain intervals	☐
		2. Frequently	☐
		3. Rarely	☐
		4. Never.	☐
II. 8.6.1	Do you perform revisions in your authority according to standard, well-established and transparent procedures?	1. Yes	☐
		2. No	☐
II 8.6.2	Do you have procedures in place to document major revisions of important official statistics?	1. Yes	☐
		2. No	☐

II. 8.7	Are you involved in the process of determining the requirements for information content of administrative registers and design of administrative data used for statistical purposes by your authority?	1. Yes	☐
		2. No	☐
II. 8.8	Does your authority have agreements signed with owners of administrative data, which set out shared commitment to the use of these data for statistical purposes?	1. Yes	☐
		2. No	☐
II. 8.9	Does your authority cooperate with owners of administrative data in order to ensure data quality?	1. Yes	☐
		2. No	☐
Your comments on Principle 8 **„Appropriate Statistical Procedures”**: *Please describe how do you assess this principle in your practice and what is your approach for its improvement.*			
II.Principle 9: Non-excessive Burden on Respondents. The reporting burden is proportionate to the needs of the users and is not excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time.			
II. 9.1	Is the statistical information that your authority produces limited in range and detail to what is absolutely necessary?	1. Yes	☐
		2. No	☐
II. 9.2.1	Do you consider the burden on respondents is fairly spread?	1. Yes	☐
		2. No	☐
II. 9.2.2	What is the share of surveys reporting respondents’ burden?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys	☐

II 9.3	What is the share of surveys using electronic means for obtaining information from respondents (e-mail, on-line, tablets, laptops)?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 9.4	What is the share of surveys using administrative sources in order to avoid duplicating requests for information?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 9.5.1	Do you perform data sharing among statistical authorities in order to avoid multiplication of surveys?	1. Yes	☐
		2. No	☐
II. 9.5.2	Do you have agreements signed for data sharing among statistical authorities in order to avoid multiplication of surveys?	1. Yes	☐
		2. No	☐
II. 9.6.1	Do you promote measures that enable the linking of data sources in order to reduce the reporting burden?	1. Yes	☐
		2. No	☐
II 9.6.2	Do you have formal agreements that enable the linking of data sources in order to reduce reporting burden?	1. Yes	☐
		2. No	☐
		3. Not applicable	☐
Your comments on Principle 9 **„Non-excessive Burden on Respondents”**: *Please describe how do you assess this principle in your practice and what is your approach for its improvement.*			
II.Principle 10: Cost Effectiveness. Resources are used effectively.			
II. 10.1.1	Is there in your authority an internal unit/procedure to monitor the statistical authority’s use of resources (financial and HR)?	1. Yes	☐
		2. No	☐

II. 10.1.2	Is there in your authority an external body (without audit functions) for monitoring/assessing the statistical authority's use of resources (financial and HR)?	1. Yes	☐
		2. No	☐
II. 10.2.1	Please assess (by 4 degree scale) the optimization level of productivity potential of ICT used in data collection, processing and dissemination. 1= High 2= Medium 3= Low 4= Don't know	1 ☐ 2 ☐ 3 ☐ 4 ☐	
II. 10.2.2	What is the share of surveys using modern ICT in data collection?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 10.2.3	What is the share of surveys using modern ICT in data processing?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 10.2.4	What is the share of surveys using modern ICT in data dissemination?	1. >75%	☐
		2. 25-75%	☐
		3. <25%	☐
		4. No such surveys.	☐
II. 10.3	Do you undertake some measures that improve the statistical potential of administrative data in order to limit resource to direct surveys?	1. Yes	☐
		2. No	☐
II. 10.4	Do you implement standardized solutions in order to increase effectiveness and efficiency?	1. No such solutions.	☐
		2. Yes (*Please specify*)	☐

Your comments on Principle 10 **„Cost Effectiveness ”**: *Please describe how do you assess this principle in your practice and what is your approach for its improvement.*		
Level of implementation of principles 7th to 10th of the European Statistics Code of Practice:		
What is your **overall assessment** of level of implementation of principles 7th to 10th of the European Statistics Code of Practice? **High (> 75%)** **Medium (25-75%)** **Low (< 25%)**		
Principle 7. Sound Methodology	1. High	☐
	2. Medium	☐
	3. Low	☐
Principle 8. Appropriate Statistical Procedures	1. High	☐
	2. Medium	☐
	3. Low	☐
Principle 9. Non-excessive Burden on Respondents	1. High	☐
	2. Medium	☐
	3. Low	☐
Principle 10. Cost Effectiveness	1. High	☐
	2. Medium	☐
	3. Low	☐

Your proposals in regards to the current Quality self-assessment checklist:

Thank you for your willingness and your time spent!

5.2. *Annex 2:* Quantitative Survey, Percentage Distribution

Fig. 1. Distribution of statistical surveys and activities included in the NSP for 2012

Bodies of statistics	15,19%
NSI	84,81%

Fig. 2. Share of statistical surveys and activities by type according to the NSP for 2012

Authority / Type of survey	NSI	Other Bodies of statistics
Sample surveys	32,12%	28,21%
Exhaustive surveys	67,88%	71,79%

Fig. 3. Level of compliance of the overall methodological framework of surveys with European and other international standards, guidelines and best practices

Fully consistent	90,00%
Large part is consistent	10,00%
Some part is consistent	0,00%
Not consistent	0,00%
Not responded	0,00%

Fig. 4. Level of consistent and all over application of standard concepts, definitions and classifications in the statistical process

Fully applied	90,00%
Large part applied	10,00%
Some part applied	0,00%
Small part applied	0,00%
Not responded	0,00%

Fig. 5. Frequency of update of the frame for population surveys

Annually	40,00%
Quarterly	10,00%
Other	30,00%
Not responded	20,00%

Fig. 6. Usage of national statistical classifications (in compliance with adopted European classifications) in the statistical process

Yes	90,00%
No	10,00%
Not responded	0,00%

Fig. 7. Presence of policy for recruitment of graduates in the relevant academic disciplines

Yes, there is such a policy and it applies fully.	10,00%
Yes, there is such a policy and it applies to a great extent.	50,00%
Yes, there is such a policy and it applies partly.	10,00%
No, there is no such policy.	20,00%
Not responded	10,00%

Fig. 8. Presence of policy for continuing vocational training of the personnel

Yes, there is such a policy and it applies fully.	20,00%
Yes, there is such a policy and it applies to a great extent.	40,00%
Yes, there is such a policy and it applies partly.	30,00%
No, there is no such policy.	10,00%
Not responded	0,00%

Fig. 9. Co-operation with the scientific community to improve methodology, effectiveness of the methods implemented and to promote better tools

Anytime when feasible.	10,00%
Frequently.	20,00%
Rarely.	40,00%
No joint activities.	20,00%
Not responded	10,00%

Fig. 10. Level of approximation of definitions and concepts used by the administrative sources to those required for statistical purposes

Maximum level of approximation.	20,00%
High level of approximation.	20,00%
Medium level of approximation.	30,00%
Low level of approximation.	10,00%
No approximation.	10,00%
Not responded	10,00%

Fig. 11. Systematically testing of questionnaires for statistical surveys prior to the data collection

Yes	60,00%
No	10,00%
Not responded	30,00%

Fig. 12. Assessment of survey design, sample selection and estimation methods

They are well based.	40,00%
They are based to big extent.	20,00%
They are based to some extent.	10,00%
They are based to small extent.	0,00%
Not based.	0,00%
Not responded	30,00%

Fig. 13. Share of surveys with existing procedure to manage over- or under-coverage and misclassification of statistical units

>75%	30,00%
25-75%	10,00%
<25%	0,00%
No such surveys.	20,00%
Not responded	40,00%

Fig. 14. Frequency of review and revision of survey design, sample selection and estimation methods

Regularly at certain intervals	50,00%
Frequently	0,00%
Rarely	20,00%
Never	0,00%
Not responded	30,00%

Fig. 15. Monitoring of data collection, entry and coding

Yes, completely - at all phases	70,00%
Yes, partially - not at all phases	0,00%
No	0,00%
Not responded	30,00%

Fig. 16. Share of surveys with regular monitoring and revision of data collection, entry and coding as required

>75%	70,00%
25-75%	0,00%
<25%	0,00%
No such surveys	0,00%
Not responded	30,00%

Fig. 17. Frequency of review, revision and up-dating of editing and imputation methods

Regularly at certain intervals	30,00%
Frequently	0,00%
Rarely	30,00%
Never	0,00%
Not responded	40,00%

Fig. 18. Revisions according to standard, well-established and transparent procedures

Yes	50,00%
No	20,00%
Not responded	30,00%

Fig. 19. Presence of procedures to document major revisions of important official statistics

Yes	40,00%
No	30,00%
Not responded	30,00%

Fig. 20. Involvement in the process of determining the requirements for information content of administrative registers and design of administrative data used for statistical purposes

Yes	40,00%
No	50,00%
Not responded	10,00%

Fig. 21. Presence of signed agreements with owners of administrative data, which set out their shared commitment to the use of these data for statistical purposes

Yes	20,00%
No	60,00%
Not responded	20,00%

Fig. 22. Co-operation with owners of administrative data in order to ensure data quality

Yes	50,00%
No	30,00%
Not responded	20,00%

Fig. 23. Production of statistics, which is absolutely necessary in range and detail

Yes	90,00%
No	0,00%
Not responded	10,00%

Fig. 24. Fairly spread burden on respondents

Yes	80,00%
No	10,00%
Not responded	10,00%

Fig. 25. Share of surveys reporting respondents' burden

>75%	20,00%
25-75%	20,00%
<25%	10,00%
No such surveys	20,00%
Not responded	30,00%

Fig. 26. Share of surveys using electronic means for obtaining information from respondents (e-mail, on-line, tablets, laptops)

>75%	30,00%
25-75%	20,00%
<25%	10,00%
No such surveys	10,00%
Not responded	30,00%

Fig. 27. Share of surveys using administrative sources in order to avoid duplicating requests for information

>75%	0,00%
25-75%	20,00%
<25%	20,00%
No such surveys	30,00%
Not responded	30,00%

Fig. 28. Presence of data sharing among statistical authorities in order to avoid multiplication of surveys

Yes	60,00%
No	20,00%
Not responded	20,00%

Fig. 29. Presence of signed agreements for data sharing among statistical authorities in order to avoid multiplication of surveys

Yes	50,00%
No	30,00%
Not responded	20,00%

Fig. 30. Presence of measures that enable the linking of data sources in order to reduce reporting burden

Yes	70,00%
No	10,00%
Not responded	20,00%

Fig. 31. Presence of formal agreements that enable the linking of data sources in order to reduce reporting burden

Yes	20,00%
No	20,00%
Not applicable	40,00%
Not responded	20,00%

Fig. 32. Presence of internal unit/procedure to monitor the statistical authority's use of resources (financial and HR)

Yes	60,00%
No	30,00%
Not responded	10,00%

Fig. 33. Presence of external body (without audit functions) for monitoring/assessing the statistical authority's use of resources (financial and HR)

Yes	20,00%
No	60,00%
Not responded	20,00%

Fig. 34. Assessment (4 degree scale) of optimization level of productivity potential of information and communication technologies (ICT) used in data collection, processing and dissemination

High	10,00%
Medium	60,00%
Low	10,00%
Don't know	0,00%
Not responded	20,00%

Fig. 35. Share of surveys using modern ICT in data collection

>75%	10,00%
25-75%	50,00%
<25%	10,00%
No such surveys	10,00%
Not responded	20,00%

Fig. 36. Share of surveys using modern ICT in data processing

>75%	50,00%
25-75%	30,00%
<25%	0,00%
No such surveys	0,00%
Not responded	20,00%

Fig. 37. Share of surveys using modern ICT in data dissemination

>75%	70,00%
25-75%	10,00%
<25%	0,00%
No such surveys	0,00%
Not responded	20,00%

Fig. 38. Presence of measures that improve the statistical potential of administrative data in order to limit resource to direct surveys

Yes	40,00%
No	40,00%
Not responded	20,00%

Fig. 39. Presence of standardized solutions that increase effectiveness and efficiency

No such solutions	40,00%
Yes	30,00%
Not responded	30,00%